

Bob Cooper's

SEPTEMBER 15 2005

SatFACTS

MONTHLY



Reporting on "The World" of satellite television in the Pacific and Asia

IN THIS ISSUE

**C1 Horizontal
has off-beam
hot spots**

**European
Bouquet
Changes**

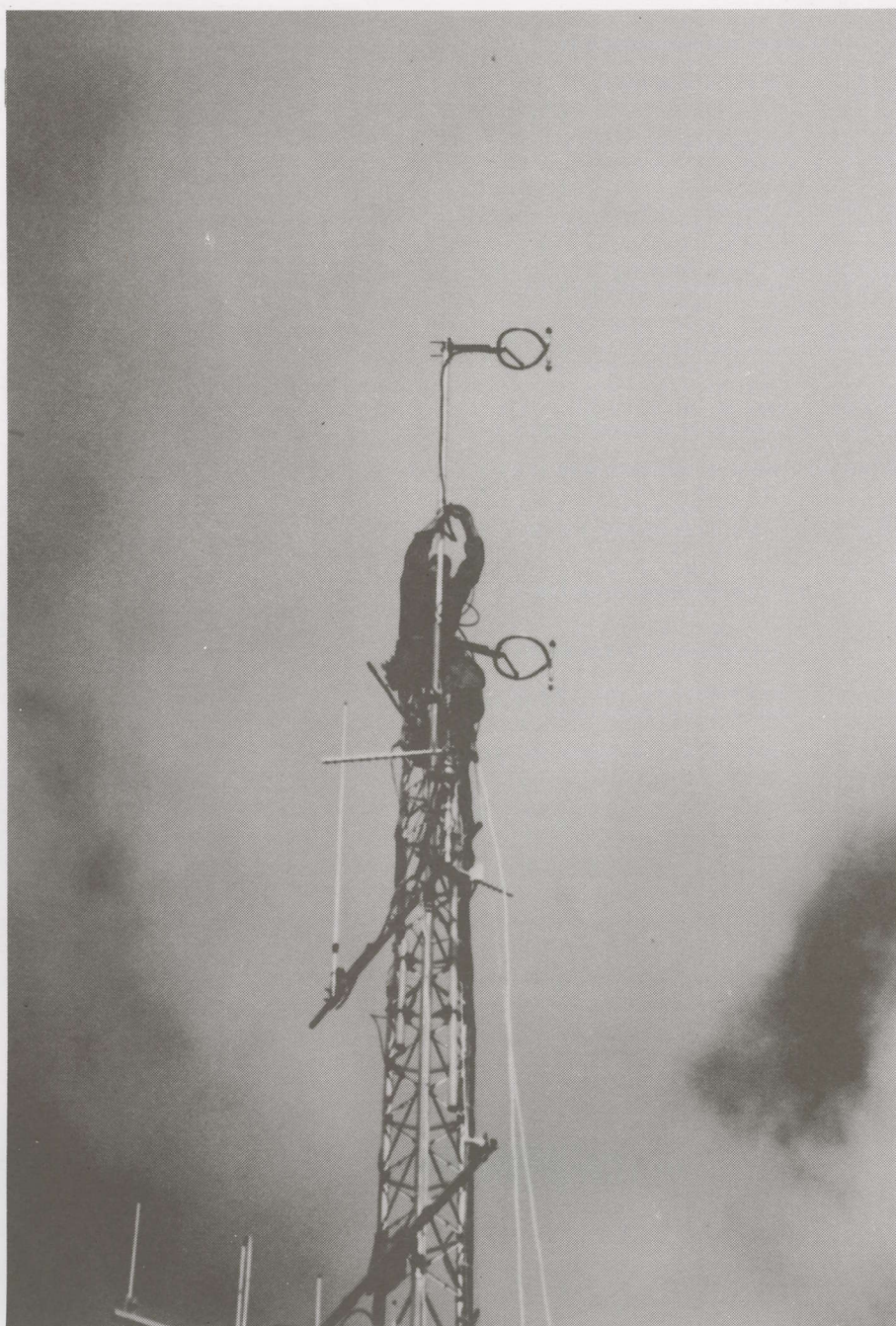
**"Angry as hell"
not going to
take it anymore**

- ✓ Latest Programmer News
- ✓ Latest Hardware News
 - ✓ PBS Ku - Samoa
 - ✓ Observer Reports

Vol. 12 ♦ No. 133

Price Per Copy:

NZ\$10/A\$11/US\$/Euro8



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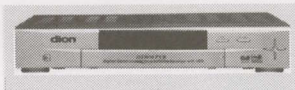
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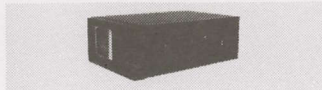
Specials this month

DT800PVR - Digital Receiver



- 40Gb HDD = 40hr Record time
- 2x CI CAM Slots
- DiSEqC 1.2
- **Fibre Optic Output Capability**
- Price: \$390 AUD + GST

Satlook - Signal Meter



- Digital, Analogue and combined versions available
- A must for the professional
- Simple menus and functions
- Price: Phone up for Quote

DreamMAX - DT470



- Irdeto embedded
- 4900 Channel Memory
- DiSEqC 1.2
- User Friendly
- Price: \$200 AUD + GST

Everything? Yeah we got

LNB

- Zinwell C Band
- Zinwell KU Band
- MTI C Band, Superhigh gain
- One Cable Solution - CBand
- Dual Output KU 11300 MHz

Positioners

- Superjack EZ-2000
- Superjack DP-6600, DiSEqC 1.0/1.2
- Technosat DP-200, DiSEqC 1.2
- Manual Actuator Driver - EW101
- SAP 2000: 99 Memory positioner

Actuators

- Superjack HARL-3618, 18" Actuator
- Superjack HARL-3624, 24" Actuator
- Superjack DG-120, H/H Mount

Receivers

- SuperNET CA, Irdeto Embedded
- Success, Free-to-Air
- Dion DT-370, Free-to-Air Receiver
- Dion 2x CI, Hardware AllCAMed
- ChangHong, Mediaguard embedded
- SuperNET Terrestrial, DVB-T
- Phoenix High Definition STB

Dish and mounts

- 1.2, 1.8m Solid Prime focus
- 45, 60, 65, 85cm KU dish Offset
- 2.13m, 2.27m, 2.4m, 3.0m, 3.07m, 3.7m, Mesh Dish, Light and Heavy Duty PSI and JOYSAT Available
- CBand Wall brackets
- CBand Concrete mounts and stands
- KU Gutter mounts
- KU Wall mounts
- KU Float mounts
- KU Tinroof mount

Dion 818 CI - Digital Satellite Receiver



- Slim Size and User Friendly OSD
- 2x CI (Common Interface) slots
- Hardware AllCAMed

SuperJack H-H Actuator, DiSEqC embedded



- All it takes is one coaxial cable....
- NO MOTOR CABLE REQUIRED**
- DiSEqC Positioner EMBEDDED!

Supernet - Terrestrial DVB-T



- Digital Terrestrial Receiver
- Slim Design
- High Quality Picture
- Easy to install and use

Dion316 - Digital Satellite Receiver



- FTA + Software Patched
- 4000 Channel Memory
- DiSEqC 1.0/1.2 Compatible
- Price: \$170AUD + GST

Switches and Splitters

- 2 and 4 way DiSEqC switches
- 0/22kHz switches
- 2 and 4 way cable splitters
- V/H Multiswitch
- 0/12V Switch

Cable - 15m, 25m, 305m packs

- RG6-U Dual Shield Coaxial Cable
- RG6-U Quad Shield Coaxial Cable
- Cat5 Actuator Cable

Plugs

- F Connectors, Screw or Clamp types
- Cable joiners
- AV Splitters
- Cable Strippers
- Cable clampers
- Various other joiners and accessories
- e.g. RCA/SCART cables and converters

Misc

- 2.4GHz AV Sender
- Irdeto 2.06B CAMs, Viaccess CAMs
- Satlook Digital Signal Meter
- Satlook Analogue Signal Meter
- Satlook Digital + Analogue combo
- Satellite finders
- Angle level measure instrument
- High Quality Compasses



SatFACTS MONTHLY

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This publication is dedicated to the premise that as we enter the 21st century, ancient 20th century notions concerning borders and boundaries no longer define a person's horizon. In the air, all around you, are microwave signals carrying messages of entertainment, information and education. These messages are available to anyone willing to install appropriate receiving equipment and, where applicable, pay a monthly or annual fee to receive the content of these messages in the privacy of their own home. Welcome to the 21st century - a world without borders, a world without boundaries.

Editor/Publisher
Robert B. Cooper (ZL4AAA)
Office Manager
Gay V. Cooper (ZL1GG)

Reaching SatFACTS

Tel: 64-9-406-0651
Fax: 64-9-406-1083
Mail: PO Box 330
Mangonui, Far North
New Zealand
Email -Skyking@clear.net.nz
<http://www.apsattv.com>

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our 12th year!

COOP'S COMMENT

The following sentence is of importance only to myself, wife Gay and son Seth. Volume 12, number 133 is the beginning of SF year 12.

Garry Cratt is concerned that I continue to find sufficient "satellite relative" material to carry on. "IF", a subscriber (and friend) I value highly but whom I have never met in person, frets I am heading for some sort of cataclysmic body function failure, "for trying to do too much in too short a time."

I take all of this on board, filter it for relevance, and typically allow it to nourish in the back recesses of what mind I have remaining. My primary problem, as it has been virtually all of my charmed life, is that I routinely under estimate how much time a project will require, how much it will cost, and the largest sin of all, whether or not it will pay its own way. They seldom do - our family operated (now nine year old) cable system being a prime example. Turning it down and sending the remaining subscribers off to the Sky NZ satellite delivered services is a goal of major importance to me at the moment.

Wife Gay appreciates that if I don't have some projects each day, I would be tempted to stay in bed working my way through a 1 metre stack of reading material that never seems to shrink smaller. Some projects are open ended - they will still remain unfinished when it is no longer possible for me to work on them. My CATJ + CSD collection, covering both publications from 1974 through 1987, is now on DVD (two DVDs are required for the something in excess of 6,000 pages). And, the DVD pre-release version of 'VIDEO PIRATES: Hiding inside your television set' will begin shipping (late) this month while the printed book format version will hopefully be ready for shipping by the end of December; fingers crossed!

A writer for a NZ magazine, working up a feature story describing my particular chosen life style, recently observed, "*Is he ten steps ahead of reality or hopelessly mired in the past?*" An interesting question which was perhaps inspired as he sat in my office corner where I demonstrated for his amusement my Internet TV2Me delivered live-TV reception first from London, then Moscow, finally New York City - and - only feet away, shelves filled with a dust laden personal collection of 1940-1950 consumer TV reception equipment. A 60 year span in television comes pretty close to book ending the beginning, and, as more imminent daily, the end of television as we have known it. Yes, that is gloom and doom. Or, *opportunity!*

I do not envy those responsible for the adaptation of yesterday's over-the-air television model to the hormone driven growth of new wire and satellite delivery modes. A friend with an empty life recently completed an exhaustive search of the free-to-view video streaming sources on the web; a thankless job because the number grows hourly. For example, after Hurricane Katrina flattened and then sunk New Orleans, gone from America's 35th largest city ('size' based upon the number of 'TV homes' there), was all semblance of local radio or TV. Just when the masses most needed official guidance and condition updates, they disappeared from view (and ears) - right along with the electricity, telephone and cable services. Pioneer New Orleans broadcaster/telecaster WWL still had some operating portable equipment but no studios, no transmission gear, no tower to get the coverage 'out'. Even if they had, the number of 'TV homes' left functional had dropped essentially to zero; why bother 'broadcasting' if there are no viewers capable of receiving you? The answer may surprise you.

A makeshift 'studio' and a Ku uplink truck became their new 'station', sending the live and recorded field reports via satellite to Houston where another TV broadcaster (KHOU) with web streaming ability (and capacity) plugs them into 'the pipe'. WWL very likely has no viewers inside of its normal coverage area, and given the state of destruction it might be months, even a year, before local viewers are back with electricity, telephone.

But hark, in 2007-2008, WWL's analogue TV transmitter will be shut down in favour of digital. Why even bother to replace the analogue, given early scheduled retirement? For now, video streaming of Katrina's aftermath is everywhere including (www.wdsu.com), (www.wgno.com), (www.wkrg.com), (www.wtok.com), (www.wjtv.com) and (www.wapt.com)

And WWL?

www.wwltv.com/perl/common/video/wmPlayer.pl?title=beloint_wfaa&props=livenoad.
New Orleans was a terrible tragedy but it also shows us unlimited future opportunities..



September 15, 2005

In Volume 12 ♦ Number 133

C1's "fortuitous" coverage is an interesting challenge -p. 7

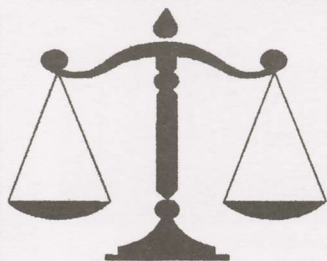
The mad, crazy, angry world of early C-band -p. 8

Departments

Programmer/Programming -p.2; Hardware/Equipment Update -p. 4; SatFACTS Digital Watch -p. 23;
Supplemental Data -p. 26; With The Observers -p. 27; installing dealers -p. 29

-On the cover-

Radio broadcasting remains a viable method of community interaction, participation, and involvement for most of the Pacific region. Here, Nick Wallace hangs a two-bay circular polarised FM band transmission array.

PROGRAMMER
PROGRAMMING
PROMOTION

UPDATE

SEPTEMBER 15, 2005

Count me in

"I am very interested in participating in a South Pacific contingent to attend Atlanta's TVRO Expo 2006 next April - count me in!"

Tony Ferris, Satellite Solutions
Honiara, Solomon Islands

The 'interested' group now total 11 from Solomon, Fiji, Australia and New Zealand. See SatFACTS #131 (July 2005) and communicate with Coop at skyking@clear.net.nz.

Branching out

"On September 1 we opened a (new) branch in Cairns. This is our first attempt at expansion after 24 years of business, believing we could do it all from Brisbane. However, with the continued population growth in Queensland, we believe we must solidify our position in this state, and at the same keep our competitors honest".

Geoff Dargie

Nationwide Antenna Systems

Memories are made of this ...

"I have received by DVD copies for CATJ and Coop's Satellite Digest and cannot thank you enough for the effort of scanning these thousands of pages! I now wait breathlessly for arrival of 'VIDEO PIRATES'!

EU, Rhode Island, USA

'VIDEO PIRATES: Hiding inside your television set' on DVD (the unpurged pre-print-publication edition) will start shipping the last week of September; see p. 32, here.

Try dispersement

"Suggest water collecting on dish surface and shunting away is dispersement, not disbursement!"

IF, Queensland

Correct, of course; our error.

'XXXX?'

"Comment regarding Australians missing their 'Fosters' and 'meat pies' (SF#132). We do like our pies but most Victoria and NSW residents drink VB while Queenslanders prefer 'XXXX'."

AI, NSW

None of which will a tour group find easily while visiting Expo 2006 in Atlanta next April.

If Fiji TV won't ... PBS could. Australian based PBS, on I701 Ku (12,648H, Sr28.066, 3/4) can be received (surprise) in 'the Samoas' (Western and American). Not on home style dishes, mind you, but adequate for larger dishes (3m and up range, Ku quality) which makes the 15 channel service a possible 'programme source' for terrestrial broadcasters. Problem: PBS 'rights' do not extend into the region (possibly being limited to Fiji proper). But those with an interest in this are optimistic that some accommodation/commercial agreement can be reached.

Fiji TV has announced agreement to carry World Cup Soccer 2006 during June-July 2006. Of special interest, a press statement included the phrase, "to exclusively air the prestigious event in Fiji and the Pacific Islands". The "and the Pacific Islands" could represent a major breakthrough for Fiji TV's programming rights problems.

Competitor PBS has countered with announcement it has secured "exclusive rights" to a pair of Indian based services; Zee TV (no mention of which Zee programme channel of which there are more than 15) and SET - Sony Entertainment Television (an Indian based service). Of further interest, Zee and Sony are being downlinked in Germany, cross the Atlanta-USA and Pacific using fibre, delivered to PBS's Citywest uplink centre for final distribution on I701. PBS has apparently also been awarded a government permit to establish terrestrial channel outlets within Fiji, something previously largely dominated by competitor Fiji TV.

India's government has announced a plan to curtail or stop downlinking into the country of any news channels originating outside India which carry advertising specifically targeted at the Indian audience. Objective? To promote development of Indian-based news channels and retain Indian advertising dollars for Indian firms rather than shipping the money overseas (BBC and CNN were specifically singled out by the government announcement - in the case of BBC, without commercials, even news programmes targeting India would be banned).

"Vulnerable Groups" in UK will have their cost of transitioning from analogue TV to digital (terrestrial) TV paid for out of a newly established UKP400 fund. Viewers unable to afford the replacement of analogue reception equipment (including, as required, the aerial equipment) will qualify to have the digital replacement paid for either totally or in part out of the fund.

In France, 1/2 million DTT receivers were sold in the four months following turn-on of the country's new digital terrestrial network. In Australia, 143,000 DTT receivers (STBs and DTV equipped receivers) were sold during period 1 April to 30 June; total at end of June estimated at 920,000 (conversions). Latest government pronouncements claiming analogue in major cities will switch off December 31, 2008, over extended period in rural areas served by regional broadcasters.

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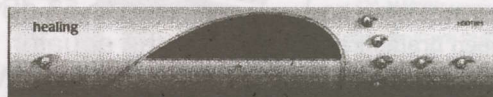
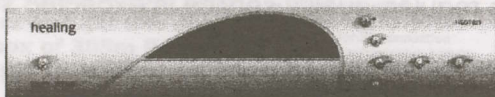
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HSDT821



"Anyone listening?"

"SF#132 article headlined, 'Is anyone in Australia listening' and reporting on the new low cost satellite transponder time offered by Uon TV in states might in fact be a project which Mike Boulas' SCTV channel has in mind. They have been asking community and special interest groups with programming to contact them - one step removed from 'anyone' with programming to air. But could or would he do it for the paltry US\$20 for 30 minutes of Uon TV? That would take much more imagination than Boulas has shown to date."

NS, Victoria

Although there is no verification of this, likely he is paying 3 to 5 times as much for equivalent bandwidth as Uon TV pays in states. Which would make US\$20 more like Au\$100 for 30 minutes - still not a bad deal and it certainly would improve Ku FTA dish system sales country-wide.

Fiji TV in Auckland?

"Regarding comment in #132 relating to Fiji TV's evening news programme (possibly) being rebroadcast on terrestrial by Mirchee's Sky Tower 12 GHz system. In fact, it is TTV picking it up (from I701), editing out any non-Fiji copyrighted material (such as pieces from the BBC, TVOne), for rebroadcasting later that evening, three nights a week."

Jim Blackman, Triangle TV Auckland
Given the heavy concentration of Fijians in the Auckland area, that seems like a good move to serve an important element of the minority population.

NZ TVOne News/ American Samoa

"Presently TVNZ is allowing me to rebroadcast TV One (evening news) free of charge in Pago Pago. I am getting no local support (i.e. no advertising at all!) for this although it is very popular here on our channel 11 plus our cable carriage. I am concerned this PAS-2 feed might be curtailed or moved back to I701 after the NZ election."

Bill Hyman, PCS TV, Pago Pago

There are several ironies here, not the least being the high 'community of interest' relationships between New Zealand and the full mid-Pacific region. Even short-wave transmissions from Radio New Zealand, after 50+ years of service, have been dramatically curtailed. Yet Auckland has the largest 'Polynesian population' of any city in the world. For a paltry sum per month TVNZ could continue to make TVOne news available Pacific-wide. Something's wrong here!

HARDWARE EQUIPMENT PARTS

UPDATE

SEPTEMBER 15, 2005

Optus insurance against premature B1 failure? Optus is scheduled to switch B3/152E, transponder 1 to NZ + Australia during September (possibly already switched as you read this). At same time, C1/156E transponder 1 has also been switched to NZ beam (12.288V/T1L, Sr 28.650, 1/2; 12.324V/T1U, Sr 24.450, 1/2); previously, only C1 12.407V (T3) has been running on NZ beam (Sr30.000, 2/3). The megahertz bandwidth 'sum' of T1L, T1U and T3 begins to equate to the present-day use-needs of Sky NZ. One possible emergency scenario if B1 repeats its tin-whisker mis-adventures would be shifting all NZ services to T1L, T1U and T3 of C1. Of course that would also require moving more than 500,000 Sky dishes 4 degrees west. In the meantime, C1 'opportunities' in NZ have grown (see report, p. 6, here).

Anyone want to live in 'Foxtel'? Or 'Sky'? American DBS operator is searching for a US town willing to convert the official name of their community to 'Dish', or more preferably, 'DISH'. The reward is that all homes in the selected community will have free-of-charge DISH TV reception systems installed, and free reception for a period of ten years. Of course 'DISH TV' expects to generate significant PR value from the promotion and within days several communities had raised their hands as 'interested'. Early entrants include Brookvale, Colorado, and, Virgil, New York, both responding they wish to be 'in the running' which will come down to a 'contest' between vying communities. Brookvale has no local cable service, Virgil does. "The cable system owner is not elated with the plan" reports Bruce Grodner, speaking for Virgil (population 2,600) when contacting DISH.

Getting messy at 100E-105E. Russia is moving Express A-2 from 80E to 103E, where it will be sandwiched between AsiaSat 2/100.5E and AsiaSat 3/105E. As recently as 1999, Russia has operated an inclined orbit C-band bird at 103E with not insignificant interference to both adjacent satellites. The announcement mentions, "the global beam will cover Asia Pacific and Australia". This move was to have taken place 1 September although one Moscow announcement also mentions October 1.

Russian AM-3 was to have gone into 'regular service' 1 September from 140E, having been launched late in June. Although this satellite has 'global and 'hemispheric' footprint capabilities, virtually all initial use (7 TV services) will be on northern beam targeting central and eastern Russia. Included are 16 C-band (up to 47.5 dBw at boresight) and 12 Ku-band (up to 53 dBw). No regular, quality service is expected south of the equator.

Dr Dish TV show found our report on 'Is anyone in Australia listening?' of interest; their monthly show is now on Uon TV (SF#132, p. 20) sponsored by Satellite Guys (<http://www.satelliteguys.us/>) - a direct result of our report.

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64cm \$25/each
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\$110/each**

**Phoenix JT6000A High Definition Digital
Terrestrial Receiver with DVI output**

Irdeto 2.06B CAM	\$110	PBI C+Ku band LNBF	\$65
Viaccess CAM	\$110	Zinwell C band LNBF	\$30
65cm Azure shine offset dish	\$25	Zinwell Ku band LNBF	\$25
75cm Azure shine offset dish	\$30	MTI C band LNBF	\$25
85cm Azure shine offset dish	\$35	MTI one cable solution LNBF	\$45
One leg gutter mount	\$18	Satellite finder	\$25
Two leg gutter mount	\$22	RG6 stripper	\$20
Tin roof mount	\$22	RG6/RG11 crimper	\$30
Wall mount	\$15	Angle meter	\$35
Superjack H-H motor	\$95	Compass	\$5
2.3m SD mesh dish	\$150	RG 6 Crimp Connector (100)	\$25
3m SD mesh dish	\$295	22K switch	\$10
3m HD mesh dish	\$330	Two way DiSEqC switch	\$10
3" 2.5m galvanised pole	\$30	Four way DiSEqC switch	\$12
3" 3m galvanised pole	\$35	Satellite 2 way splitter	\$1.50
3" 3.5m galvanised pole	\$40	Satellite 3 way splitter	\$2
3" Triangle Pole for C band dish	\$50	Satellite 4 way splitter	\$2.5
Speaker Stand for caravan use Ku dish	\$45	4 way multi-switch	\$35

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dish**

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(\$146/each x 5)

AZ/EL mount \$32/each



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Ku band satellite from
Optus B3 + Optus C1 +
Pas 8 + Pas 2

Just one dish to receive all

\$150/each

Up to four
LNBF
30 deg.
wide

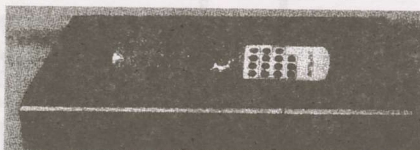


Optus B3/Pas 8 Free To Air channel Package

Phoenix 2800A digital satellite receiver x 5
64cm foldable arm dish x 5
Zinwell 11.3GHz/10.7GHz/universal
Ku band LNBF x 5
Gutter mount/wall mount x 5
One box of RG6 cable

\$975 (\$195/each x 5)

Magix 9600 Digital satellite receiver with embedded cam + 2CI \$160/each



Optus B3/Pas 8/Optus C1 Irdeto embedded channel Package

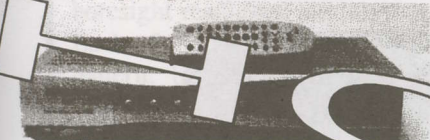
Koscom 1600A Irdeto cam embedded digital satellite
receiver x 5
64cm foldable arm dish x 5
Zinwell 11.3GHz/10.7GHz/universal Ku band LNBF x 5
Gutter mount/wall mount x 5
One box of RG6 cable

\$1275 (\$255/each x 5)

C band free to air channel Package

Phoenix 2800A digital satellite receiver x 5
2.3m SD mesh dish x 5
Zinwell C band LNBF x 5
3" 3m galvanized pole x 5
One box of RG6 cable

\$1975 (\$395/each x 5)



Koscom 1600A

**Irdeto Embedded Satellite Receiver
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- Spectrum-analyzer with expanded spec-
trum.
- Digital BER, QPSK and S/N-ratio.
- 4.5" B/W monitor for PAL/NTSC/SECAM.
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- LNB voltage 13/18V, 22 kHz tone switch.
- DiSEqC control (1.0, -1.1, 1.2).
- KU- and C-band (normally inverted video).
- 99 memory-positions for spectrum pic-
tures.
- Satellite identification.
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- RS 232 for PC connection
- Built in, rechargeable battery.
- Only 5 kg complete with carrying-case.
- Transponder content analysis.

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- 2-900 MHz spectrum analyzer
- Presents full range spectrum (and expanded)
- Very high accuracy, $\pm 1\text{dB}$ (at 20°C)
- SAT-part:
- 920-2150MHz spectrum analyzer. Digital BER, QPSK and
S/N-ratio
- Satellite-ID and TV/Radio-channel info (NIT)
- Tunable audio bandwidth 5.5-8.5MHz
- LNB voltage 13/18V, 22kHz tone switch
- DiSEqC according to level 1.0, -1.1, 1.2
- KU- and C-band (normally inverted video)

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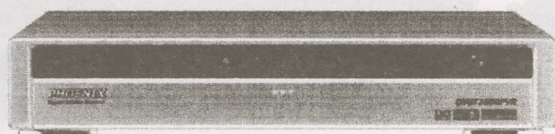
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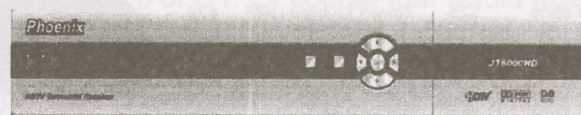
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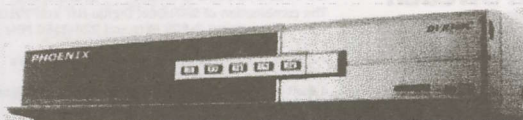


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OK - so they have moved some services around - to NZ???

Really strange?

This saga began when an Auckland SatFACTS reader noticed his Sky NZ reception for National Geographic channel was carrying adverts for Foxtel. Not quite aware of how the system worked, he next wondered whether this meant Foxtel was suddenly newly available in the land of long white cloud.

In fact Sky NZ takes a National Geographic feed from C1 using a 6m range dish, loops the service feed into their own multiplex and sends it on to B1's vertical side package that consists of the Sky NZ package. Sometimes, apparently, they 'cover' the Foxtel adverts with NZ inserted break-time messages, sometimes they do not; it comes down to manpower and available hardware to implement covering content whenever a source (such as Foxtel's National Geographic) elects to drop in a self-promoting segment.

But our reader did not realise this and as a result, using 1.5m dish went searching for C1 horizontal (the vertical side 12.407 is of course on a NZ + Australia beam and is very strong on dishes as small as 90cm). This was not the first such search - in the months that followed activation of C1 (August 2003 and after) a similar search had been performed and there was simply no signal present. This time would be different.

C1 has two Australia-inclusive beam patterns available; "NA" and "NB". The primary difference between the two is the tightness with which C1 controls 'overspill' beyond the coastal outline of the target country; "NB" is 'looser' and goes further than "NA" but the difference is typically not worth bothering about.

What he found was total clear sky lock using the 1.5m dish on (Austar) 12.305H (7 programme channels), (Foxtel) 12.358H (9 programme channels), (Foxtel) 12.438H (9 programme channels), (Foxtel) 12.478H (17 services, not all video), and finally (Foxtel) 12.518H (an additional 19 'service' channels). The Sr for 12.305H is 30.000, FEC 3/4 while the remainder are Sr 27.800, 3/4. A short form tabulation of his findings appears here. Note the FTA 'check' service in boldface.

Has the original C1 beam changed (the satellite's original boresight readjusted slightly)? Has the power been increased? Each of the transponders logged is using the "NB" coverage pattern; but so too are others not logged (i.e., 12.398H, 12.558H, 12.598H, 12.638H, 12.689H). There is a clue - a message - in this fact.

Off-boresight reception has been described at length in previous SatFACTS issues. It is more common at C than at Ku but hardly unusual. Here is what happens.

Within the satellite, waveguide (the microwave equivalent of RG6) is used to couple various transponder output amplifiers to a specific feed pattern antenna (NA, NB). When a transponder "group" can be remotely directed to either of two (or more) transmit coverage patterns (boresights), the waveguide array becomes complex and somewhat

Fortuitous Reception in NZ from C1 Hz

As received within 50km of Auckland (North Island) on a 1.5m offset dish, Sky NZ grade LNBf.

12.305H - Sr 30.000, 3/4; 7 total 'services' including **Expo Channel FTA.**

12.358H - Sr 27.800, 3/4; 9 total services

12.438H - Sr 27.800, 3/4; 9 total services

12.478H - Sr 27.800, 3/4; 17 total services

12.518H - Sr 27.800, 3/4; 19 total services

If you live in NZ - should you also be looking at C1 and in particular at the transponders here? The answer is yes - a suitable clear-sky adventure. A second reporter, alerted by our reporter, has had success on the same transponders with a 1.0m dish although the lock is, as might be expected, more marginal.

Is this somehow related to the B1 Sky NZ 'backup challenge'? Very unlikely - the puddle was 'built in' (not intentionally of course) when the satellite was designed and bolted together.

Note: Access to Foxtel (Austar) service in NZ is of course grey market as neither has NZ 'rights'.

unpredictable. Energy intended for a specific feed "leaks" to another, sometimes both simultaneously created a new, unintended (as in not planned for) new, additional pattern. The reason why some NB's are doing this and others are not relates to the way the waveguide plumbing is configured at C1 - this is a common side-effect of 'puddles' and very few puddle sites report enhanced puddle-level signals from all of the transponders on a particular pattern (such as NB). The transponders 'missing' (12.398H et al) are therefore a significant 'clue' as to the 'puddle origins' of this fortuitous reception.

The effect on the ground is known as a 'puddle' - a relatively small area that is 'illuminated' at a received power level significantly stronger than might be expected. It becomes the difference between Sky NZ's 6 metre dish for taking National Geographic and our reporters 1.5m even though both receive sites are within 50km of one another (note that National Geographic is on 12.478H, a transponder which our reporter finds locked on the 1.5m antenna). An 'off-boresight puddle' can be as much as ten dB stronger than the predicted signal level for a given puddle location. The geographic size (area puddle-illuminated) can be very small (nobody knows how small this might be - perhaps less than a kilometre square) up to tens of kilometres on a side (the shape of the puddle can be almost any form from circular to totally irregular).

These guys were crazy - mad - possibly sick!

A Series: And you thought YOUR entry into TVRO was exciting?

Prior to October 1980, it was clearly an illegal act in North America to own a home satellite dish system and tune-in TV (radio, data) transmissions. Moreover, it was a 'federal offence' rather than being a whippy local or state/province violation.

But in Canada, it was not only illegal - the federal authorities were quick to assign an arrest warrant through the Canadian mounties against anyone foolish or brave enough to install such a system.

It helped if you were 'mad' (as in the famous movie line, "*I am mad as hell and not going to take this anymore*") or simply bravado. It also helped if you had no visible assets of value because in Canada, at least, when someone was apprehended with an 'illegal satellite terminal' the laws allowed the (federal) government to press for financial penalties in a court of law.

Rod Wheeler. He was both "mad" (as hell) and believed he could get away with a system because of his location in the wilds of Canada's Northwest Territories. Residing near the quaint and isolated community of Yellowknife (NWT) on the northern shore of Great Slave Lake, Wheeler lived a nomadic pioneering kind of existence; a log-cabin 4 miles from 'town', generating his own electricity, collecting rain or melting snow in a giant metal cauldron suspended over a stone faced fireplace that provided he and his family with warmth during the long Canadian winter, and an 'oven' of sorts. His neighbours walked on all fours, growled a lot and bayed at the moon. It might seem he would be a very unlikely candidate to create and operate one of the first five "home satellite dish systems" in North America; or indeed, the world.

Moreover, it seemed even less likely Wheeler would not only create a dish for his home, but actually go into business building systems for others. For example, you can't live without a telephone, mail delivery, or electricity and yet in the normal course of 'doing (your) business' you find plenty to be frustrated about when a supplier neglects to ship something, it arrives not working, or you simply need to locate support information. Multiply that by Wheeler's isolation and you come to the correct conclusion: Rod Wheeler would not be denied. Anything he wanted.

So in 1977, during the all too brief NWT summer, Wheeler assembled at both great effort and expense a 16 foot parabolic dish, a commercial grade (there was no other option at the time) 4 GHz video receiver, and by hook, crook or dumb luck the all important 50 dB gain LNA (LNA? Low Noise Amplifier, the predecessor to today's LNB). All of the parts, including the monster dish antenna (weighing more than



Wheeler's 4.5m home built dish has to be viewed with two factors in mind: (1) It is 1977 and Wheeler has never even seen a 'real dish', and, (2) he lives in extreme-rural Northwest Territory where anything remotely approaching a 'metal fabrication shop' (or materials) was as rare as a Bikini clad Hollywood model strolling across his six-foot-deep-in-snow tundra yard on Christmas day.

3,500 pounds), were transported to his cabin down a muddy, rutted trail strapped to a 'sled' he built for the purpose out of trees felled on his property. Over the winter, neck deep in snow, he got it working with high quality reception from an RCA satellite, a Western Union satellite and Canada's ANIK-1. All of this was of course on C-band as Ku band was but a wet dream in the mind of planners during the winter of 1977-1978.

One of Wheeler's many activities (there was no full-time employment for someone of his unique skills in NWT) was to 'help out' at the Yellowknife cable TV system; 5 channels of TV, totally reliant upon videotape sent up a week late from southern Canada. *Tonight's news* was actually exactly 7 days old when Yellowknife's 2,500 cable subscription homes tuned in. This irked Wheeler (interpretation: "made him mad...") because while the townies were watching news reported 168 hours prior, in his log cabin he was watching the 'real stuff'. He investigated why the Yellowknife cable system could not simply install a dish and found layers of Canadian bureaucracy standing between him and live TV. He had a plan, a "mad act", conceived in dismay and frustration. And over the months he had become quite literate on what the bureaucratic rules preventing a dish for Yellowknife cable actually said, and meant.

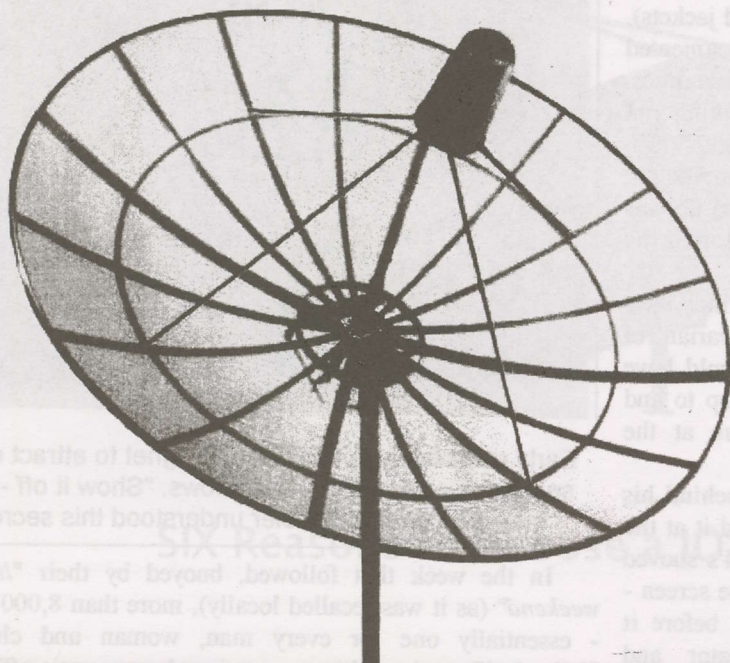
For example, the rules allowed you to construct (assemble) a 'private' dish system but prior to turning it on (making it receive something) the regulations required the builder to sign a 'deed' turning the completed system over to the



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Canadian Government; they would pay you \$1 Canadian for it. The rules became more impossible. Then because the Canadian Government was not in the business of purchasing home constructed dish systems (only in discouraging their existence), they also demanded the builder provide an annual fee (C\$1,500) paid to government to cover the anticipated costs for annual maintenance of the dish system.

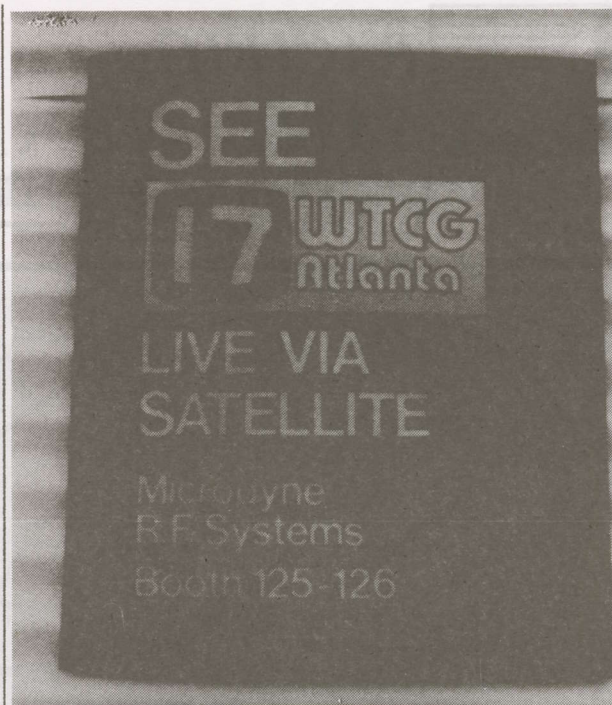
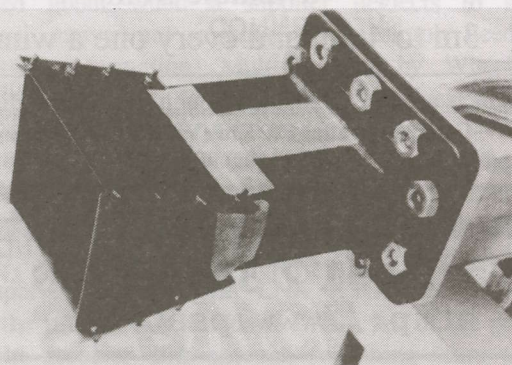
Wheeler's plan. In Yellowknife, government was represented by a small contingent of RCMP (Royal Canadian Mounted Police - the guys who still wear smart red jackets). Normal day to day policing was well understood, documented by procedural manuals. Over a beer with one of the mounties, Wheeler worked out mounties faced with something not appearing in their manual were required to "go south" to a more senior official for a ruling or advice. He also worked out that during weekends and holidays RCMP Yellowknife was 'flying blind' - essentially, they had their hands tied until the southern support staff was back to work.

His plan. July 4-5 in Canada (depending upon which days of the week they fall) are holidays; the Canadian variant of the American's July 4th. If it fell just right, he would have two weekend days and two to three days leading up to and following the weekend to make a 'four day' run at the regulations.

Onto a log sled went the 16 foot dish, towed behind his four-wheel drive into Yellowknife, where he parked it at the cable headend. An hour of positioning, some 2 x 4's shoved under the sled at just the right spot and there on the screen - Atlanta's pioneering 'super station' WTCG (years before it became WTBS). Now, connect to a modulator and instant-live-television for Yellowknife homes; their first ever! Live professional sport, movies, a range of programming never before seen in the Canadian Far North (Yellowknife is within hailing distance of the Arctic Circle). For most of the cable homes, it was a weekend of great pleasure - for the first time they were a part of the *live-in-real-time* universe. No longer were they second class distant cousins of the heavily populated southern border areas.

RCMP. Naturally they instinctively realised Wheeler was doing "something illegal". But *what?* Their procedural manuals did not have "live American satellite reception" as a violation category. A string of wired queries went south, to pileup at an unattended 1978 equivalent of a fax machine where they would remain unread until July 5th. Wheeler became an instant local-hero and he played the new status to advise the community that their "fortuitous reception" was likely to be short lived. Indeed it was - two hours after the southern bureaucrats returned to work on 5 July, the order came to Yellowknife's Mounties: "Shut it down."

Early feeds - G10 board bolted together!



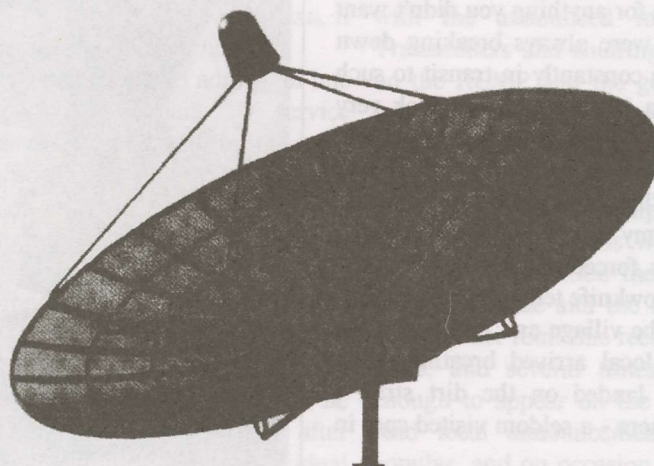
Early satellite reception was a magnet to attract even seasoned veterans at trade shows. "Show it off - and they will come". Wheeler understood this secret.

In the week that followed, buoyed by their "*live TV weekend*" (as it was recalled locally), more than 8,000 letters - essentially one for every man, woman and child in Yellowknife - rained down on various bureaucratic offices 'in the south'. Each pleaded for a return of live television. None were answered individually although a number of relevant bureaucratic agencies did issue 'statements of clarification' defending their ban on 'live (American) TV in northern Canada.

It would be two years before live television returned to Yellowknife (cable) and then only from Canadian sources. In the interim, Wheeler enlarged his campaign to break the bureaucratic bottleneck. The Canadian general press followed the story with fascination - a "mad" (they meant, this time, "crazed") engineer "run-amuck" as the major city (Toronto, Vancouver) dailies nick-named the man from Yellowknife. Wheeler was but warming up. He would go on to create TVRO reception systems, coupled to low power (ten watt or less) VHF transmitters for a number of NWT mining camps, villages where (he was cautious to pre-ensure) there was no regular television of any kind. His logic was, "When the CBC is already in an area with even a single channel of abbreviated per day programming, I would be fighting the federal government (which owned CBC)". But his press notoriety assisted him in identifying more than 20 'population centres' with no TV of any kind - sometimes as few as five families, up to several hundred. (The) Northwest Territory, his home 'province/state', was dotted with hundreds of special-purpose settlements, many or even most without the benefits of television.

One by one they contacted Wheeler and he went to work to duplicate his Yellowknife effort; 16 (later 12) foot dishes, receivers, LNA, and one or more 1 to 10 watt 'modulator/transmitters' spitting out the VHF microvolts to homes as far as twenty miles distant. Wheeler's reminiscence

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covering this period are filled with intrigue, humour, and focused purpose.

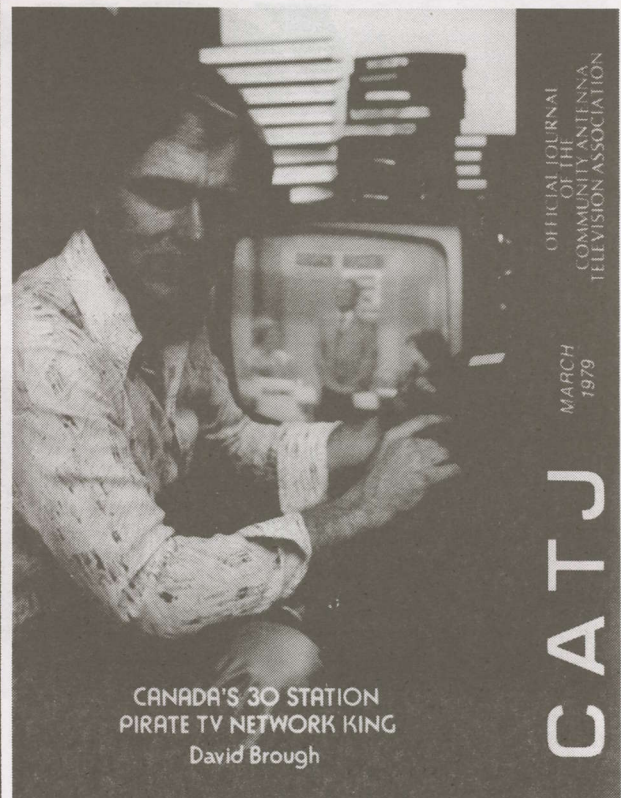
"I was in a mining town near Norman Wells, essentially on the Arctic Circle. Moreover, it was mid-December with no sunlight at all save for a few glimmer rays around noon daily. I had shipped in, using several different freight flights, a 16 foot dish and the electronics, marking it as "Caterpillar Parts" which was a standard subterfuge for anything you didn't want the authorities to inspect. D8s were always breaking down and parts for the machines were constantly in transit to such locations. The metal petals on a 16 foot dish can look very much like a segment of a D8 front blade if you package them properly! This was a game - a serious game. The RCMP had orders to 'dog' my every trail, follow me if necessary. For all I knew, they were monitoring my telephone traffic which would not be difficult as I was forced to use a VHF radio telephone to get back to the Yellowknife telephone exchange.

"We had the parts safely in the village and had begun the assembly of the dish when a local arrived breathlessly to advise two mounties had just landed on the dirt strip. I instantly knew why they were there - a seldom visited spot in the wilderness.

"Every individual in town knew we were there - right down to the 3 year old kids. And each had been advised to say they had never heard of 'Rod Wheeler' and could not supply any information. Sure enough, RCMP went door to door seeking information and eventually they appeared in the maintenance yard where the mining company rebuilt broken equipment. I saw their headlights and we promptly stopped assembly on the dish, threw several tarpaulins over it (laying on its back at the time) and crawled under the tarps ourselves - myself and two local helpers. The mounties walked all around us, one stuck a riding whip down under the tarp and lifted it up just far enough to reveal a metal strut yet uncovered with a panel. Fortunately, he had not been 'trained' on what to look for and after mumbling something about 'cold metal' they walked away. A few hours later they boarded their single engine Cessna and left. Four or five hours after their departure, we joined a party of nearly a hundred people in the local worker's club to celebrate WTCG on their lone TV screen."

The mounties of course came back as word spread of "live TV in the camp". What happened next is best related by another Canadian pioneer in the "first time TV world"; David Brough of Ontario.

Brough preceded Wheeler with a different kind of television; tape originated. Brough spent four years (1974-1978) appearing before Canadian bureaucrats at all levels, from the Prime Minister down to regional CBC (Canadian Broadcasting Corporation) officials, attempting to rationalise a 'policy' that would expand existing TV coverage into small, rural communities in northern Ontario and Quebec. Brough, a former live-on-the-air puppeteer for a major Canadian broadcaster, had become enthralled with the power of television to teach children basic life skills. His children's programme was well received and widely acclaimed for innovative ways of grabbing the under 7 year olds and making them learn or want to learn new 'life-skills' while most of his TV compatriots were squirting white foam onto studio guest's heads to get cheap laughs. What buried itself in Brough's psyche was the quick-learn skills of the under-seven-year-olds and their desire, if challenged, to want to learn more.



David Brough's "against all odds" success story was awe inspiring - he 'beat' the authorities into submission and changed the face of Canadian out-back television after exhausting all legal remedies.

His fame opened doors to government agencies but his message was going nowhere. Brough was narrowly focused on Canadian native Indian communities ("Innu") and others isolated by distance and access from mainstream Canada. He saw television as more than a tool of commercial entertainment, advocating the marriage of fun with subliminal messages relating to personal hygiene, learning basic skills such as reading, and family cohesion.

With a modicum of technical background, and a fast learner, David Brough urged the Canadian government to allow creation of low power, community service television stations designed to be run by 'locals' in isolated centres where the only way 'in or out' was typically a dirt strip runway suitable for one or in the best case two engine 8 seater planes. He had researched a list of several hundred such communities, created elaborate maps to show their location (never anticipating the bureaucrats who would review his presentations would even know where Pickle Lake was located).

Virtually every government office he visited, putting on 'shows' of up to two hours to sell his vision, threw him out. The Health, Education and Welfare folks saw him stepping into their private preserve. The government operated broadcasting network, CBC, said they could do the same thing as he but wanted government to allocate in excess of \$100,000 per community to do this task. Brough's total community station plan came in at under C\$10,000. Which of course made him a target of the CBC which believed their \$100,000 per community system was 'bare bones' and anything less was 'amateurville'. After more than three years

of frustration and no progress, Brough adopted the approach of Rod Wheeler - although neither knew the other at the time.

"I had spent more than a thousand days of my life trying to convince starch-shirted glassy-eyed government employees that something like this would first of all be beneficial to the communities involved, and secondly, inexpensive. They were not interested in my suggested solutions - only in finding ways to make me look like a foolish idealist far removed from the real world. In fact, as I would shortly prove on my own, it was they - not me - that were living in a fantasy land."

Brough had used the technical services, and advice, of one of Canada's (and the world's) most brilliant TV service engineers, Sruki Switzer (who was responsible, by the way, for the technical planning for Sky NZ's UHF pay TV launch). Sruki, a legend then and today and widely featured at any gathering of cable TV engineering types, is featured prominently in "TELEVISION: The Technology that changed our lives" (1). Switzer gave Brough a technical plan, detailed to the last resistor, for a one-watt VHF transmitter including the radiating element (antenna) fed by a BETA format tape deck. What Brough had come to was his own plan that he would set up shop inside his Toronto apartment and day after day videotape off-air presentations from individual broadcasters, melding them into Beta tapes which could then be shipped by air to 1-watt transmitters spread throughout northern Ontario and Quebec. The tapes would be shown, reboxed and sent on to the 'next station in the chain' and eventually returned to Toronto for erasure and re-recording with new material. To supplement this, Brough's Switzer design included a low-cost local TV camera for live broadcasts in each community.

The government, of course, wanted no part of his plan and refused his 'license applications' to legalise the 1-watt stations. Brough expected this and went ahead anyhow; essentially, he became a 'TV Pirate'. Within a year of launch,

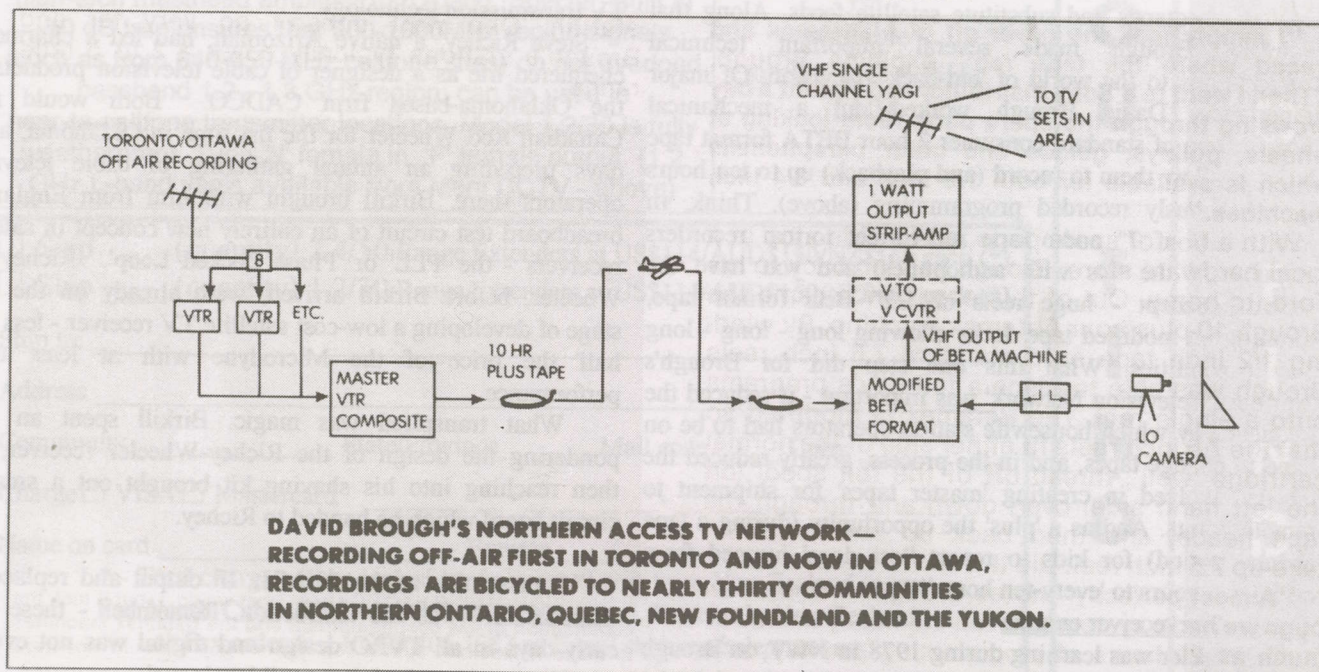
20 communities were so-equipped and Brough was up to his eyeballs in massive retaliation from the various government agencies who felt 'violated' by what he was doing.

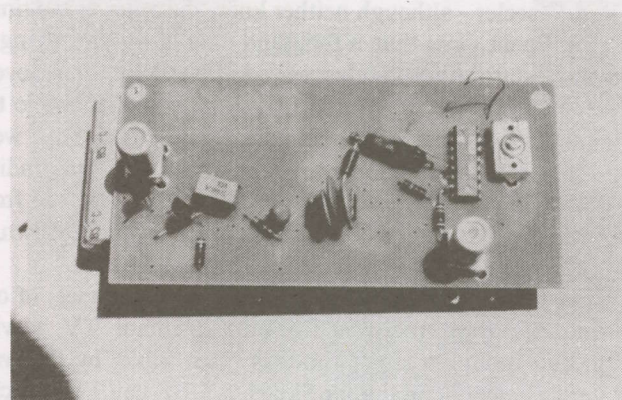
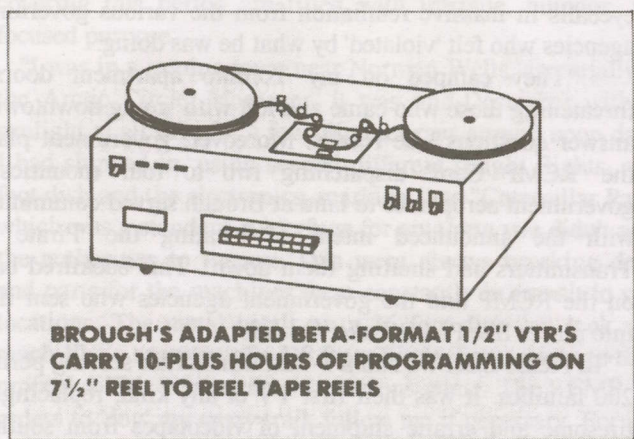
"They camped on my Toronto apartment doorstep threatening those who came and left with 'going downtown to answer questions'" he recalls. Moreover, government played the 'RCMP Card' dispatching two to four mounties in government aeroplanes to land at Brough served communities with the announced intent of locating the 'Pirate TV Transmitters and shutting them down'. This backfired badly on the RCMP and the government agencies who sent them into places like Pickle Lake, Ontario.

"In Pickle Lake we had a 1-watt transmitter serving perhaps 200 families. It was their first TV of any kind, replacing the tiresome and erratic shipment of videotapes from southern Ontario to individuals who happened to own a home tape machine. Our station there was located in the kitchen of a local housewife and the twenty foot mast plus antenna was stuck on her roof. She received our tape shipments, played the tapes, and several times per day stopped the tapes long enough to appear on the one-camera shot where she would read local announcements. This turned out to be quite popular, and on occasion amusing. For example, a local kid worked out that if he showed up at the 'studio' to report his dog was 'lost', he could go on local TV and describe his missing pet. Pretty soon every kid in town created a 'missing pet' because it was a passport to being on TV. What began as a sixty second 'local news break' shortly turned into a steady stream of kids standing in line to be next on TV and breaks grew to ten minutes. Finally the housewife station manager worked out why this had turned from a public service to a nightmare and issued an edict: 'The next kid who loses his dog and comes here to be on TV to report it is going to get thrashed, on camera, with my whomping stock!', she announced. Amazingly, lost-dog reports stopped.

"But the real challenge occurred when four mounties in a RCMP two-engine plane landed on Pickle Lake's dirt strip. The lonely single mountie who was stationed full-time in the town carelessly announced their arrival a few hours in advance, and word spread like wildfire. "They are coming to shut down our TV station".

1/ The detailed story of Brough and Wheeler, along with other 'mad pioneers', is found in the "CATJ + CATJ" DVD collection. If you find this highly compressed version of 'our/your history' amusing, interesting or sickening, turn to page 32, here.





Birkill's original PLL breadboard- in Oklahoma 1978.

"Within minutes the workers in the mine stopped work, and gathered at the local pub. By the time the plane landed, 80 miners supported by their wives and children were standing in a line at the airport waiting for the four mounties to disembark their Cessna. Fuelled by the threat of losing their television and several rounds of beer, the miners stood as a solid line blocking the only road from the landing strip into Pickle Lake. Most of them were carrying axe handles, which they raised above their heads in a threatening fashion while shouting various epithets in French and English. The mounties stood there by their plane for several hours, using the plane's radio to seek advice from headquarters further down the chain in populated Ontario. The miners tired of the lack of action and moved on the mounties, resulting in all four hopping back into the plane and heading off to disappear through the low hanging clouds.

"The reports of the confrontation spread rapidly, making the major Canadian news wires even before the mounties returned to home base. What it said to dozens, hundreds of similar isolated communities, was this: 'If you want TV badly enough to stand-up and fight (or threaten to fight) for it, the 'feds' will back off. It was an important victory for rural community television."

Brough was, by 1978, already planning for phase two; he would cease feeding his affiliate stations with laboriously created videotapes and substitute satellite feeds. Along that pathway, Brough made several important technical contributions to the world of 'out-back' television. Of major importance, David Brough worked out a mechanical modification of standard consumer 2 hour BETA format tape decks to allow them to record (and playback) up to ten hours of continuously recorded programming (above). Think, in your mind, of 7" audio tape reel-to-reel format recorders (popular in the 70s with audiophiles) and you have the general concept - huge reels of 1/2" Beta format tape, spinning on modified tape decks allowing long - long - long play capabilities. What this one step did for Brough's 'Northern Television Network' was important - it reduced the frequency by which housewife station operators had to be on hand to change tapes, and in the process, greatly reduced the labour involved in creating 'master tapes' for shipment to remote points. And as a 'plus' the opportunity (during a tape change period) for kids to report 'lost dogs' jumped from every-two-hours to 'every-ten hours'!

The satellite receiver enigma

As Wheeler was learning during 1978 in NWT, as Brough would co-discover by 1979 in Ontario, while it might be

possible to self-build relatively low cost (C\$2,000 and under) suitable satellite receiving dishes, the other two major parts - the receiver and the LNA - were dollar specific and dollar big bucks. A suitable receiver in 1978-1979 was in the US\$6,000 region while the LNA was at least half that. For Brough, dropping the full cost of a complete local-town-system including the transmitter to C\$10,000 was both a challenge and a calling. Wheeler, with some help, had a partial answer.

Of the commercial receivers available in early 1979, the Microdyne cable receiver was most cost effective but a healthy US\$6,000. Wheeler was determined to break that barrier.

To do this, he travelled to Oklahoma in July 1978, shortly after his Yellowknife cable 'live TV weekend', to spend a week with two individuals who, together, would do more to 'break the TVRO receiver price barrier' than virtually the collective talents of everyone else involved in the industry.

Steve Birkill, an Englishman from suburban Birmingham, had pioneered home C-band reception in Europe. An employee of the technical arm of the BBC, Birkill was building his resistor-capacitor-up self designed satellite receivers from 1976 or so. In his professional life, Birkill maintained dozens of BBC repeater and regional transmitter sites in northeastern England and very few people in the rapidly emerging satellite world were better grounded in basic TV transmission technology.

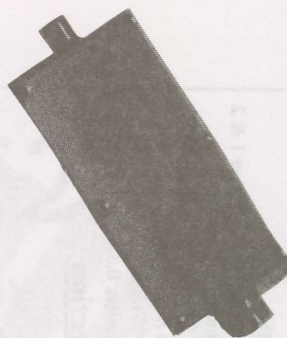
Steve Richey, a native Arizonian, had led a charmed if chequered life as a designer of cable television products for the Oklahoma-based firm CADCO. Both would meet Canadian Rod Wheeler for the first time in Oklahoma, a few days preceding an annual gathering of cable television operators there. Birkill brought with him from England a breadboard test circuit of an entirely new concept in satellite receivers - the 'PLL' or 'Phase Locked Loop'. Richey and Wheeler, before Birkill arrived, were already on the final stage of developing a low-cost satellite TV receiver - less than half the price of the Microdyne with at least equal performance.

What transpired was magic. Birkill spent an hour pondering the design of the Richey-Wheeler receiver, and then reaching into his shaving kit brought out a smallish circuit board which he handed to Richey.

"Connect this at the 70 MHz IF output and replace the demodulator" was the instruction. Remember - these were early days in all TVRO design and digital was not even in common conversation; it was all 'analogue'.

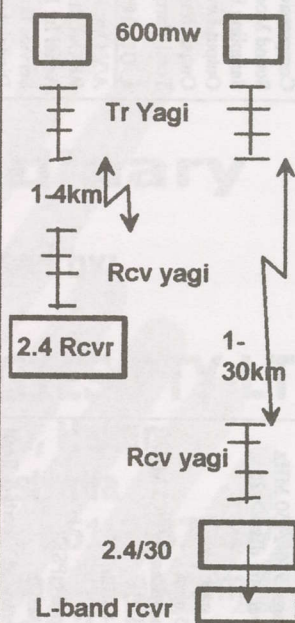
Model 2.4/50 2.4 GHz Range Expander

0.4 dB typical noise figure, 50 dB typical gain, input 2.3-2.7 GHz; converts 2.4 GHz to 1250 MHz L-band where standard analogue TVRO receivers (with adjustable bandwidth) can be used to receive video, data transmissions from point to point / point to multipoint 10/200/600mw transmitters. With suitable Yagi antenna (*) on receive circuit end, P5 quality video over LOS (line-of-sight) distances of 30km +. "N" female in, "F" out. (* - YA02409, YA2413 Yagi from Merit CCTV - www.meritcctv.co.nz)



It is all about circuit gain

Standard 10/200/600mw or 1w 2.4 GHz video/data transmitters are significantly 'range/coverage' restricted by the insensitive design of low-cost 2.4 GHz receivers. 'Circuit gain' is a combination of (1) transmitter power, (2) transmit antenna gain (in dB), (3) receive antenna gain (in dB), and, (4) receiver sensitivity parameters. Inexpensive (\$200 or less) 2.4 GHz receivers typically require +80 dBuV to produce a colour image, up to +100 dBuV to produce a P5 image. The model 2.4/50 2.4 GHz range extender plugs in a low noise front end (+20 dBuV full colour sensitivity), 50 dB of circuit gain and downconverts the 2.4 GHz transmission to L-band (2.483, for example, comes out as 1167 MHz). This allows you to substitute high quality (typically <\$50 these days) adjustable bandwidth analogue L-band receivers for the insensitive 2.4 GHz receivers, while gaining LOS distance as great as 30km. Low noise, high gain, and block down conversion all work to make your installation job quicker, easier and most of all, better! Model 2.4/50 is fully weatherproof, type 'N' female in, L-band "F" output.



Model 1.2/30 1.2 GHz Range Extender

In areas where L-band (1200-1450) links are possible, the 1.2/30 1.2 GHz Range Extender adds 40 dB of low noise (50 Kelvin) off-antenna circuit gain; think of it as a high-tech masthead amplifier for L-band. Special: Built in -40 dB trap ensures that 900-1000MHz region signals (such as from 940-950 MHz cellphone sites) do not overload passband 1.2 - 1.3 GHz region; can be used in near-to-cellphone transmitter locations. Model 1.2/30 is fully weatherproof, Type 'N' female in, 'F' female output. (1.2 GHz L-band yagis available from Merit CCTV - above)

Photo not yet available - similar to 2.4 GHz LNB

THIS IS WHERE YOU FIND THE IMPOSSIBLE TO FIND

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☐ Ship _____ (quantity) 1.2/30 Range Extenders at US\$114/AUD\$150/NZ\$165 each (*).

Ship to: _____

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Name on card _____ Expires ____/____/____

* - Total charge will be inclusive of air parcel post from New Zealand to you.
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(ex-X-Box, ex-4640)

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IF Section

Input Frequency Range: 950-2150 MHz
Input Frequency Level: -65 dBm >25 dBm

Noise Figure: 12 dB max

Input Impedance: 75 ohm

Acquisition Frequency Range: +/- 3 MHz

I.F. Bandwidth: 36 MHz

Input Return Loss: -8 dBm

Tuning Step Size: 125 kHz

Demodulation: Shaped QPSK

Symbol Rate: 2-45 Msym

FEC Coding: Concentrated Viterbi & Reed Solomon

k= 7 rate: 1/2, 2/3, 3/4, 5/6, 7/8, AUTO

LNB Section

Connector: F-type, loop through

Power: 400 mA maximum

Horizontal: DC 16-129V

Vertical: DC 11-14V

Band (Hi/Lo) Selection: 22 kHz, On/Off

DiSEqC 1.2 Interface: 64 Universal LNB

System Resources:

Processor: 32 bit (80 MHz)

SDRAM: 8 M/byte

Flash: 2 M/byte

EEPROM: 32 kbyte

Video Section:

Decoding: MPEG-2, MPEG-1 compatible

Compression Technique: Main profiler, level

Format: PAL, NTSC

Frame Rate: 25 hertz

Aspect ratio: 4:3, 16:9

Active Pixel: 720x576, 720x480

Output impedance: 75 ohm

Composite Output Level: 1Vp-p

Red Output: 0.7V P +/- 0.1V p-p

Green Output: 0.7V P +/- 0.1V p-p

Blue Output: 0.7Vp +/- 0.1V p-p

Bar Amplitude Error: 10%

Audio Section:

Compression Technique: MPEG-1, 2 layer 1 & 2

Sound Mode: Dual, Stereo

Sampling Frequency: 32 kHz, 44.1 kHz, 48 kHz

Output Level: 3 Vp-p Maximum

Output Impedance: 600 ohm

Total Harmonic Distortion: 0.3% Max at 1 kHz

Connector Section:

A/V Out: RCA x 3

RF Out: IEC Male

Aerial In: IEC Female

Service Port: RS-232C (15 Kbps Max)

Digital Audio Output: RCA

Modulator Section:

Output: Pal G/I/K (Ch, 21-69)

Power Supply:

AC 90-250V, 47-63Hz, 40 W/30W Max

Dimensions:

260mm (wide) x 240mm (deep) x 58mm (high)



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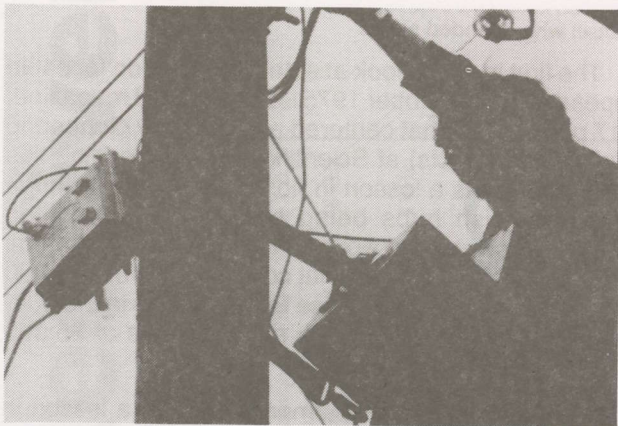
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WA	Norsat	08-9451-8300
NT	Johnny's Electronics	08-8972-1102
NZ	Hills Industries (New Zealand)	+64-9-262-3052
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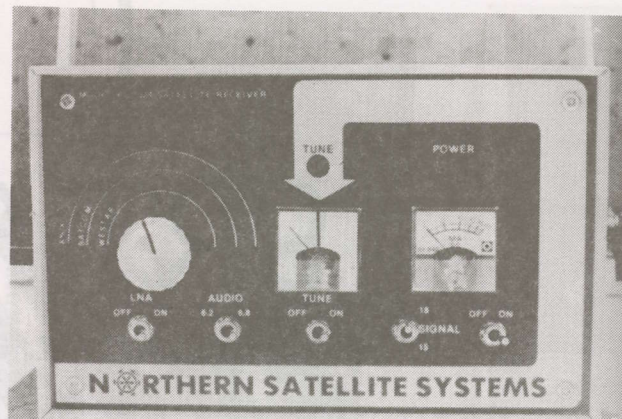
Richey photographs are very rare - for all of his openness, he was reclusive and very private. Here, partially shadowed by his arm, the engineer-of-all-engineers hanging on a power pole adjusting a cable TV amplifier. Yes, 'a baby face'.

Twenty minutes later Richey had Birkill's 'PLL demodulator' circuit board attached to his prototype receiver and the comparison tests were on. It worked. Actually, it worked so much better than the original Wheeler-Richey design, and as a plus, the \$6,000 Microdyne, that nobody present could quite believe their eyes. Fed by a twenty foot dish, the pictures were brilliant. A quick change to a ten foot and still brilliant. Another quick change to a six foot dish, in an era when ten foot was marginal, and still brilliant. PLL would from that point on become the 'catch phrase' for all modern satellite receivers.

Richey, Wheeler and Birkill were days later gathered in an Oklahoma state-run resort lodge attending a gathering of 500-plus cable operators. Ninety percent of those attending were 'mom and pop' (small community) cable operators from rural regions all across North America. And for most of them, the cost of adding the new satellite services was a major concern. Almost non present could even fathom spending the then going fee of \$125,000 to create a 9-11 metre dish equipped with a single LNA and single receiver. Any new development that made it cheaper, and possible to use dishes smaller than the 9 metre standard, was of immense interest.

Richey's small firm had display space at the gathering in the commercial area, and Wheeler plus Richey placed their prototype satellite receiver on a table, covering it with a small towel to keep out inquisitive eyes. Off the exhibit floor, the duo pondered how to introduce the 'Northern Satellite Systems' (Wheeler's company name under which he was installing clandestine terminals in the wilds of NWT) receiver. Richey had added up the parts cost (under \$300 US) and Wheeler had summed it with his projected cost of sales and marketing. They settled on US\$2,995, almost precisely half of the then lowest price 'competitor', Microdyne.

That would turn out to be a mistake. When the towel 'came off' and the square hand fabricated box was unveiled, a long line of would be users formed. Most in the industry expected satellite receiver pricing to drop, a function of volume of production growing; nobody expected to see a 50% lunge in one initial step. The commercial competitors, including Microdyne, Microwave Associates, Terradyne and Collins, reacted indignantly. First they attacked the reliability (an unknown factor of course), the lack of credentials of the manufacturer (Richey was good, very-good but this was his



NSS receiver (10 were built in the form shown) was the very first 'self-designated "home dish receiver"'. But it began as a cable system receiver until attracting so much angry reaction the designers renamed it for 'home use' - the biggest mistake of all.

first venture into 4 GHz hardware), and finally 'the price'. Many angry words were exchanged, and as the sales manager of Microwave Associates would proclaim, "There is no reason to bring this out at \$2,995. What you have done is place all of the rest of us, name brand manufacturers, into disrepute. Had you made it \$4,995, we could have lived with that. But our cost of manufacture and marketing is much greater than yours and there is no way we can deal with a \$2,995 price tag. You leave us no choice but to ridicule your effort."

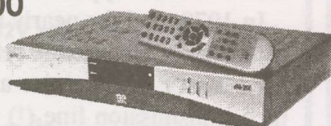
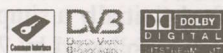
An interesting insight into how the 'real world' sometimes works. Richey and Wheeler took all of this on board and made a decision. If \$2,995 was too low for the comfort level of the well respected competitors, they would make a simple 'marketing change'. Henceforth, the Northern Satellite Systems receiver would be directed at the 'home' TVRO market, *not* the cable market. If a cable operator wanted one (which most of those in attendance did), fine. But 'officially' this was a 'home receiver' not a commercial receiver. At least now the name-brand firms could accept the pricing structure as none of them even pretended to have a 'home' satellite receiver.

If coming out at \$2,995 had been an error in judgement, changing the market identity would turn into something worse; *far worse*. Up to this point, nobody in cable saw a threat - any threat - from private individuals spending tens of thousands of dollars for home-dish-systems. Sure, some would be sold but as long as the pricing stayed in the \$20,000 and up region for ten foot dish systems, with marginal performance at that, cable saw no reason to worry.

By this point the 'magic PLL' circuit was also common knowledge. Wheeler arranged a table top demo, using a feed from a ten foot dish antenna set up at the cable show, and to everyone's amazement except Wheeler, Richey (and Birkill) the video quality was essentially as good (in some cases better) than the images the \$6,000-\$10,000 receivers were producing from 15 foot and larger dishes.

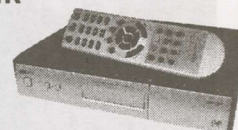
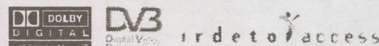
Seeing it work was the final straw. Up to that moment, it was comfortable to believe that you could not expect much from a \$2,995 receiver, even when connected to a large dish. There on the display screen was the proof - but rather than votes of approval, what Richey and Wheeler heard were nasty, attacking barbs. A ten foot dish, a \$2,995 receiver and perfect pictures? In an instant, everyone who saw the display

homecast eM200



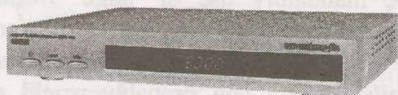
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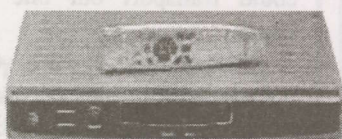
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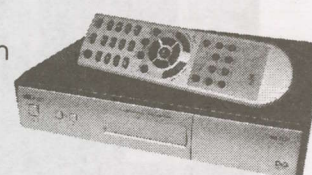
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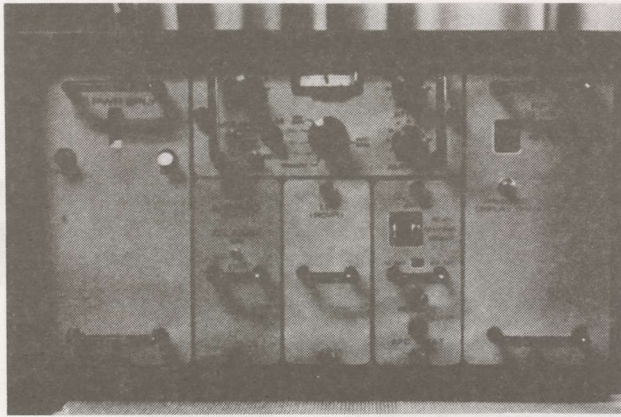
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Pre-home-TVRO receiver (above) by Terracom was slightly modified 4 GHz telephone company video receiver; \$7,500. Early home style TVRO receiver (below) was Ramsey proto-type (note paste on labels!) doing everything the Terracom did; \$995.



knew that 'home dish systems' were not only possible, but inevitable. And not one cable operator attending liked that idea. The reality was a hammer blow to cable's belief that they and they alone would be able to 'play in the satellite game'.

Within an hour of the 'seeing is believing' table top display, the receiver had disappeared from the table and Richey had disappeared from the exhibit area. Several of his important (to him) cable TV clients, the guys who purchased his cable amplifiers and other manufactured items, had pushed him into a corner (actually, into a men's bathroom!) where they read him the riot act. It went something like this.

"If you bring out this receiver, we are all cancelling our orders with you and will never purchase RDC equipment again for our cable systems."

The NSS receiver quietly disappeared. A total of ten were completed and went back to Canada with Wheeler who would work to resurrect their production in his own country. None were likely to end up in cable system headends. But the technology, especially the PLL/phase locked loop demodulator, would quietly and quickly become a standard design feature for the name brand folks such as Microwave Associates. Birkill would return to the UK where his development work on the PLL would mature with increasingly improved sensitivity each month. Ultimately, the design would be adopted in the (1979) Ramsey Electronics early entry 'home dish' satellite receivers with a new wrinkle created by firm founder John Ramsey; "divide by two PLL". PLL would stay viable through 1983 and was a prominent reason why Ramsey's version would hit the North American market at \$995 in July 1980.

And there is more

There was a second Richey satellite receiver also at the cable convention and while the NSS version attracted 99% of the ultimately angry interest, perhaps the brilliance of the man was more apparent in the alternate receiver.

In 1978, and for nearly two years thereafter, a satellite dish consisted of a parabolic reflector, a feed (initially a simplistic 'feed horn'), a low noise amplifier (LNA) followed by 7/8ths inch transmission line (!) indoors to the receiver (see p. 22). All early receivers, including the NSS, were 4 GHz input - down conversion to an IF (intermediate frequency) occurred inside the receiver proper, not at the antenna/feed. Therefore the transmission line 'loss', at 4 GHz, was considerable and this explained the mandatory use of 'huge' 7/8ths inch diameter corrugated coaxial cable (a product of Andrews). You might get by on a 'short run' of 50 feet or less with low-loss RG8 family cable - you probably would not, as flexible line (opposed to rigid 7/8ths line) was simply never design to transport 4 GHz energy.

Richey pondered this quandary and conceptualised that if he moved the 4 GHz down converter (which was built into standard receivers) out-of-doors to the antenna, low cost cable (such as RG6) could be substituted. But there was a greater problem - one RG6 connected to one outdoor down converter could transport but one transponder-channel at a time. Unless...

Here Richey was way out on his own in a design field nobody had ever attempted. Suppose the outdoor ('block' as it would ultimately be called) downconverter was a broadband device, converting the full 3,700 to 4,200 band to some lower IF, such as 400 to 900 MHz? Now the 400 - 900 frequency range could be transported from satellite antenna to indoors (where modified satellite receivers would dial between 400 and 900 to locate a specific transponder).

Richey selected 400 to 900 for sound reasons. He knew RG6 would function there, that "F" fittings (as opposed to the \$50 each 7/8ths line fittings) would also work there. And if one needed to do additional signal amplification, splitting, the 400 - 900 MHz region was quite ideal for this expansion.

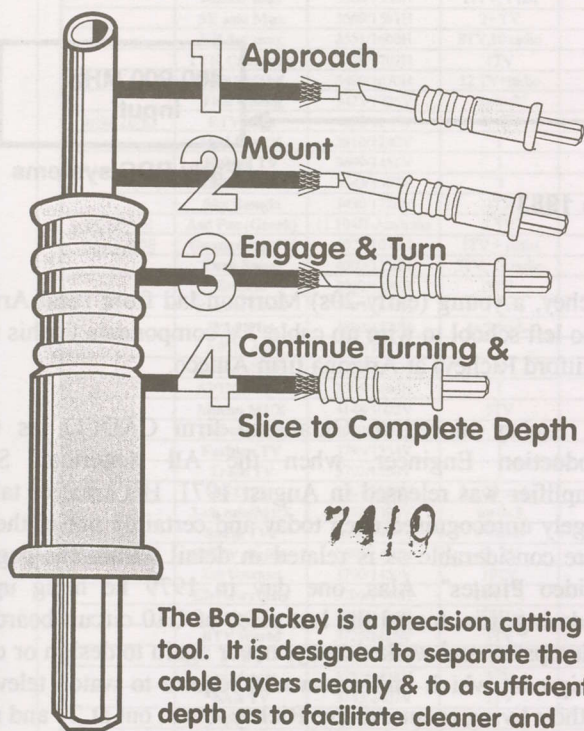
There were serious design hurdles to conquer. Creating a 'block down converter' that would function in a stable manner while out of doors where temperature swings were significant, processing 3,700 - 4,200 MHz, was something never before attempted. Early versions (including the prototype he carried in a shoe box to the cable show) were quick to jump frequency when the temperature dipped (or rose) 10 degrees either side of an ambient 22C or so. But by having only one down converter, rather than individual down converters installed in each receiver, Richey was on the trail of a major improvement in satellite receiver technology.

His show-box prototype was shared with several other savvy microwave design engineers during the Oklahoma show (Richey was, if nothing else, a 'generous' man who never attached great value to his own brilliance, essentially 'giving away' million dollar ideas to anyone who would share a conversation with him.) Two attending engineers jumped at the concept and returned to their respective design labs to work on the outdoor temperature stability problem. Within six months, Hughes Electronics introduced a 'block down conversion' package and used it to cut individual receiver prices to (one guess allowed here!) \$2,995. A Texas start-up firm, Satvision, followed shortly after with their own BDC



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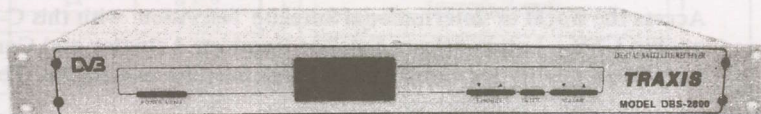


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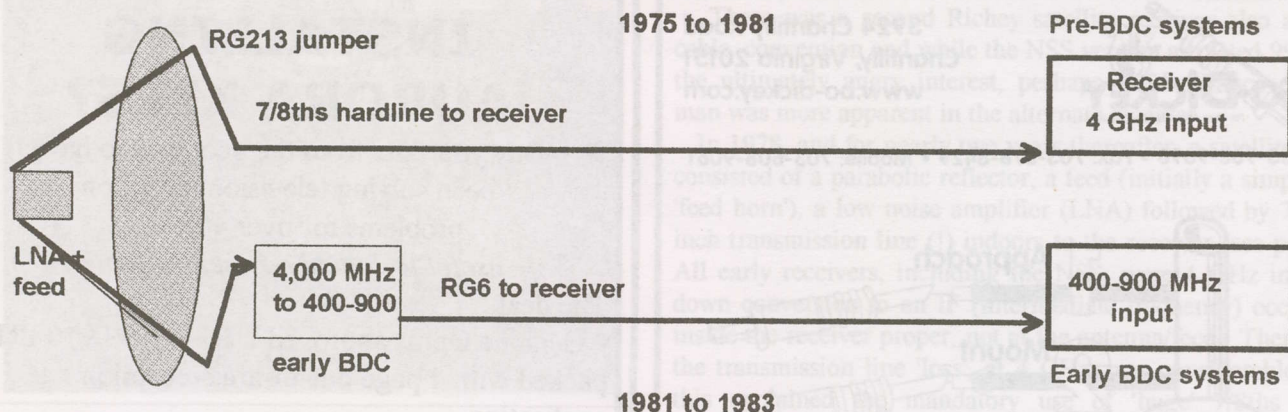
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Both however relied on standard high dollar microwave components for the block down converter (originally called a LNBC, it was not a part of the LNA) and charged accordingly (\$2000) for it. Ultimately, of course, but not before late 1982, the LNA would turn into the now familiar LNB which allowed users to install one small box at the feed (modern LNBs have the feed built-in). Until the 'real' LNB came into being, home (and commercial) systems used back-of-dish LNBC (block converters) linked to the LNA and feed at the front of the dish with a short run of flexible RG8 family coax; thence, inside to the single or multiple receivers with a single run (per polarity - two separate lines for vertical plus horizontal) of RG6; see above.

The ground rules for what was to become, over the 1979-1982 period, 'home TVRO', originated with Steve

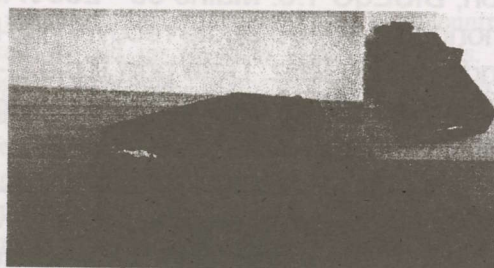
Richey, a young (early-20s) Mormon lad from rural Arizona who left school to wire up cable TV components for his uncle (Milford Richey) at Arizona firm Ameco.

Richey moved to Oklahoma firm CADCO, as Chief Production Engineer, when the All American Sports Amplifier was released in August 1971. His creative talents, largely unrecognised even today and certainly not in the 70s, were considerable as is related in detail within the pages of "Video Pirates". Alas, one day in 1979 he hung up his soldering iron, tossed the last piece of G10 circuit board into a dumpster, and walked away, never again to design or create equipment which millions would require to watch television in their living rooms. Steve Richey, burnt out at 27 and much missed by the design world; his skills were spectacular although his business credentials were not.

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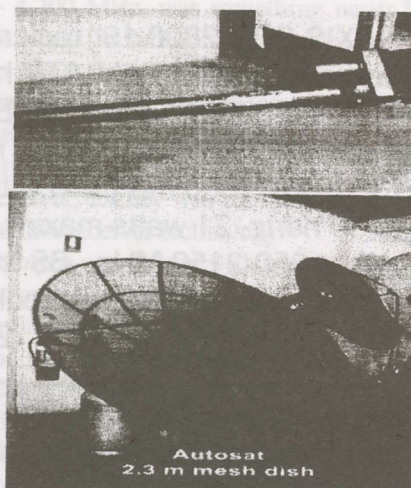
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SatFACTS Pacific/Asian MPEG-2 Digital Watch: 15 SEPT, 2005

Bird	Service	RF/IF &Polarity	# Program Channels	FEC	Msym
Thom3/78.5	SkyChAust	3695/1455H	up to 3	3/4	5(,000)
	ANT Greece	3672/1478H	1 TV	3/4	13(,333)
	TARBS ME mux	3640/1510H	12TV, 12 radio	2/3	28(,066)
	Ch Nepal	3626/1524V	1	3/4	15(,556)
	Mahar mux	3600/1550H	11TV, 1 rad	3/4	26(,667)
	SE asia Mux	3569/1581H	2+ TV	3/4	12(,500)
	RR Sat mux	3551/1600H	8TV, 10 radio	3/4	13(,333)
	TVK Cambodia	3448/1702H	1TV	1/2	6(,312)
	TARBS/Th5	3480/1670H	12 TV+radio	2/3	26(,667)
	Thai Global	3425/1725V	up to 7?	2/3	27(,500)
InSat 2E/83	ETV mux	4005/1145V	6+ TV	3/4	27(,000)
	Hyd Dig 2E	3910/1240V	1	3/4	5(,000)
	Kairali TV	3699/1451V	1	3/4	3(,184)
	Indian mux	3643/1507V	3	3/4	19(,531)
	Sky Bangla	3430/1720V	1TV	3/4	6(,000)
NSS6/95E	Ant Pac (Greek)	11.104H-Australia	1 TV	3/4	2(,800)
As2/100.5E	Guangdong TV	4075/1075H	1TV + radio	3/4	6(,000)
	Euro Bougt	4000/1150H	5TV, 19 radio	3/4	28(,125)
	SatLink	3960/1190H	3TV	3/4	27(,500)
	Reuters News	3905/1245H	1TV	3/4	4(,000)
	WorldNet	3880/1270H	4+/18radio	1/2	20(,400)
	APTN Asia	3799/1351H	1	3/4	5(,632)
	Reuters/Sing.	3775/1375H	1	3/4	5(,631)
	APTN Asia#2	3705/1445H	1	5/6	4(,166)
	Macau MUX	4148/1002V	5TV	3/4	11(,850)
	Dubai MUX	4020/1430V	4+, radio	3/4	27(,500)
	Fashion TV	3796/1354V	1	3/4	2(,626)
	Trace TV	3792/1358V	1	3/4	2(,400)
	BYU-TV	3767/1383V	1 + 20 audio	1/2	6(,530)
	3-ch miniMUX	3752/1398V	up to 3	3/4	5(,640)
	Saudi TV1	3660/1490V	7+tests	3/4	27(,500)
As3S/105.5E	CETV digital	3680/1470H	1+ TV	3/4	26(,670)
	Zee bouquet	3700/1450V	10TV	3/4	27(,500)
	Ch News Asia	3706/1444H	1TV (+)	3/4	6(,000)
	Azlo TV	3716/1434H	1TV (+)	3/4	7(,000)
	BTV World	3725/1425V	1TV	3/4	4(,450)
	TVB 8	3729/1421H	1TV	3/4	13(,650)
	Zee Movies	3732/1418V	3TV	3/4	6(,500)
	SAB TV	3743/2407V	1TV	3/4	3(,300)
	AAJ-TV	3750/1400V	1TV	3/4	2(,820)
	Airrang TV	3755/1395V	1	7/8	4(,418)
	Now TV +	3760/1390H	up to 10TV	7/8	26(,000)
	Star TV	3780/1370V	7(+)/TV	3/4	28(,100)
	GXTV	3806/1344V	1TV + 3 radio	3/4	4(,420)
	Shaanxi TV	3813/1337V	1TV + 2 radio	3/4	4(,420)
	Anhui TV	3820/1330V	1TV + 2 radio	3/4	4(,420)
	Jiangsu TV	3827/1330V	1TV + 2 radio	3/4	4(,420)
	HLITV	3834/1316V	1TV	3/4	4(,420)
	Star TV	3840/1310H	7(+)/TV	7/8	26(,850)
	Star TV	3860/1290V	5(+)/TV	3/4	27(,500)
	Arabsat MUX	3880/1270H	10+TV, 14Radio	3/4	27(,500)
	Dragon TV	3886/1264V	1 TV	3/4	4(,800)
	Shaandong	3895/1255V	1TV + 6 radio	3/4	6(,813)
	CCTV1	3904/1246V	1TV, 1 radio	7/8	4(,420)
	Jilin TV	3914/1236V	1TV + 2 radio	3/4	4(,420)
	Star TV	3920/1230H	4+ TV	7/8	26(,850)
	CNNI	3960/1190H	8TV, 1 radio	3/4	27(,500)
	StarTV	3980/1170V	6+TV	3/4	28(,100)
	Star TV	4000/1150H	8(+)/TV	7/8	26(,850)
	Sahara digital	4020/1130V	8TV, 1 radio	3/4	27(,250)
	Hubei TV	4035/1115H	1TV + 2 radio	3/4	4(,420)
	Tianjin TV	4046/1104V	1TV + 2 radio	3/4	5(,950)
	Sichuan TV	4051/1099H	1TV + 1 radio	3/4	4(,420)
	Qinghai TV	4067/1083H	1TV + 2 radio	3/4	4(,420)
	Hunan TV	4082/1068H	1TV + 1 radio	3/4	4(,420)
	Fashion/HK-Asia	4088/1062H	1TV	3/4	2(,626)
	Pakistani TV	4091/1059V	4TV, 1 radio	3/4	13(,333)
	Sun TV	4095/1055H	1	3/4	5(,554)
	PTV National	4106/1044V	1TV, 1 radio	3/4	3(,333)
	TVB8 Mux	4111/1040H	4TV	3/4	13(,650)
	Indus News	4115/1035V	1	3/4	3(,331)
	CCTV bqt	4129/1021H	4 TV, 4 radio	3/4	13(,240)
	Zee Bqt #2	4140/1010V	8(+)/TV	3/4	27(,500)
	Henan TV	4166/984V	1TV + 8 radio	3/4	4(,420)
	Fujian TV	4180/970V	1TV + 2 radio	3/4	4(,420)
	Jiangxi TV	4187/963V	1TV + 2 radio	3/4	4(,420)
	Liaoning TV	4194/956V	1TV + 2 radio	3/4	4(,420)
Cak1/107.5	Indovision (S-band)	2.535, 2.565, 2.595, 2.625, 2.655	33(+)/TV	7/8	20(,000)
T Kom/108E	IndoBqt	3460/1690H	up to 6	3/4	28(,000)
C2M/113E	TPI	4185/965V	1	3/4	6(,700)
	TVE Asia-Africa	4160/990H	1	3/4	5(,632)
	Anteve	4144/1006V	1	3/4	6(,510)
	Kabelvision Mux	4080/1070H	7+ TV	7/8	28(,125)
	Indostar	4074/1076V	1	3/4	6(,500)
	Satelindo	3935/1215H	1	3/4	6(,700)
	Bali TV	3926/1224H	1	3/4	4(,208)
	Indo MUX	3880/1270H	3+ TV	7/8	28(,121)
	TVRI	3765/1385H	1TV	3/4	5(,555)

Receivers and Errata

CA (#1, 3); FTA audio #2 (dm)
Late July 04: room for more (FTA)
CA + 23FTA(A1TV, IRB3, Vision Norge, Pakistan)
New 03/03; FTA
Thai + Indian services; FTA inc. Vibe TV, Sindh TV
MRTV3, MRTV (DM)
3TV, 5radio inc. Hellas TV Greece FTA
FTA
3FTA: TV5, VTV4, ATN Bangla
FTA (reaches SE Australia)
Several ETV now here; wide beam
SCPC, OK E. Aust. wide beam
SCPC, OK E. Aust wide beam
corrections 12/02
New - November 2002
(still) FTA 11-04; was 11.083H
July 04: FTA
FTA TV + radio; RAI PID changes April 2005
Real Madrid (V769, A770) English FTA
Was 3923H; sometimes FTA
FTA; multiple audio services V2360, A2320
Sometimes FTA; also 3895Vt
FTA & CA
FTA and CA - NASA reports included
5 chs TV, FTA, some tests
FTA; Dubai Sports Ch some English, soccer-
FTA as of May 1, 2003
new here Dec 2004; Euro-French music videos
Increased coverage; great variety audio chs(03-05)
Sun-TV, Surya TV, KTV (FTA)
FTA MCP; Yemen, MBC EUROsport tests
replaces analogue same freq; V33, A32
Now SECA 2 CA (10-04)
English + V1160, A1120; 525, 625 versions
Was parallel to 3640Hz analogue (now gone)
Conax CA, all Hindi films
SAB may no longer here here; moved to NSS-6?
New April 2005; English, urdu
FTA SCPC; New PIDs V3601, A3606 June 2003
CA + FTA; English includes NOW, Blmbg, Living As
NDS CA (Pace DVS211, Zenith)
Guangxi TV; was As2
Was As2
Was As2
Was As2
Was As2; HeiLong
NDS CA (Pace DVS211, Zenith)
NDS CA (Pace DVS211, Zenith)
New April 2004: link to Optus B3 Globecast
Shanghai
Apparently Mongolia
Star Sports Asia (+), FTA NTSC; V514, A670 (10-04)
PowVu CA; new SR Apr 29; CNN radio FTA
NDS CA; Star News India FTA VPID 514, APID 648
NDS CA w/ 4(Chinese) FTA
New Sr September 2004
Was As2
new December 2004
Was As2
Was As2
Was As2
New July 2005
new Sr, channels, Nov 2003
"History Channel" - SCPC, some English
MATV Ch Movies now Irdeito 1
Hindi (+ "Plus"); day parts
moved from 4115
Now SECA 2 CA (10-04); 1 occ. FTA (varies)
Was As2
Was As2
Was As2
Was As2
NDS CA using RCA/Thomson,
Pace IRDs; 2.535 has 2 FTA
also 3586H/17.500, 3496H/19.615
FTA SCPC; NT/NC only
New August 2003
change from 4055V; FTA SCPC
also try 3500H, 27.000, 3/4; strong NZ
FTA (new 06-03); V2201, A2202
test card - only - reported
FTA, may not be active full time
FTA; Sr change 01/03; erratic
bounces btwn FTA and CA; unreliable (12-04)

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym
	Brunel/Sing	3733/1417H	1TV	3/4	6(,000)
	SCTV	3726/1424V	1TV	3/4	6(,620)
	RCTI	3473/1677H	2	3/4	8(,000)
As4/122E	CCTV internal	4100/1050V	6	3/4	27(,500)
Jc3/128	Miracle Net	3996/1154V	3 up to 6	5/6	22(,000)
	Asian bqt	3960/1190V	up to 8	7/8	30(,000)
Ap6134E	Multiple	4140/1010V	up to 8	7/8	27(,500)
T18/138	Tests	3460/1690V	8	3/4	30(,000)
	LTV Laos	3804/1346V	1		
Jc2A 154	BYU-TV	3915/1245V	1+ 20 languages	3/4	4(,166) (?)
	Astro Mux	11.602H	up to 17TV	3/4	41(,500)
	VTV MUX	11.522V	3 TV	3/4	9(766)
B3/152	AuroraBiz	12.407V	4 TV, 10 radio	2/3	30(,000)
	UBI/tests	12.425V	up to 13 TV + radio	3/4	22(,500)
	Globecast 2	12.525V	13 TV, 8 radio	2/3	30(,000)
	Globecast (feeds)	12.550-555V	1TV	3/4 & 2/3	6(,110/670)
	Globecast	12.564V/T13	2+ TV	2/3	30(,000)
	UBI/tests	12.613H/T14L	11+TV	3/4	22(,500)
	UBI/tests	12.640H/T14U	11+TV	3/4	22(,500)
	Globecast 1	12.658V/T7	14TV, 15 radio	2/3	30(,000)
	UBI/tests	12.674H/T15L	11+TV	3/4	22(,500)
	UBI/tests	12.701H/T15U	11+TV	3/4	22(,500)
	WA ABC	12.702V	1 TV, 1 radio	7/8	14(,288)
	WA SBS	12.720V	4TV, 2 radio	5/6	12(,600)
	WA GWN/WIN	12.738V	2TV	7/8	14(,295)
CI/156E	Optus test bed	12.288V/T1L	6+ (ABC) TV	1/2	28(,650)
	Aurora	12.324V/T1U	4+ (ABC) TV	1/2	24(,450)
	Pay TV	12.365V/T2	11TV, 2 radio	3/4	27(,800)
	Aurora Home	12.407V/T3	5TV, 13 radio	2/3	30(,000)
	Pay-TV	12.447V/T4	5TV, 4 data	3/4	27(,800)
	Pay TV (test)	12.487V/T5	3+ TV, data	3/4	27(,800)
	Aurora 2	12.527V/T6	7TV, 20 radio	3/4	30(,000)
	Pay-TV	12.567V/T7	10 TV	3/4	27(,800)
	Pay-TV	12.607V/T8	10 TV	3/4	27(,800)
	Pay-TV	12.647V/T9	10 TV	3/4	27(,800)
	Pay-TV tests	12.720V/T10	6+TV, data	3/4	27(,800)
	Austar	12.305H/T11	6TV, 24 data	3/4	30(,000)
	Pay-TV	12.358H/T12	10 TV	3/4	27(,800)
	Pay-TV	12.398H/T13	10 TV	3/4	27(,800)
	Pay-TV	12.438H/T14	6TV, 3 data	3/4	27(,800)
	Pay-TV	12.478H/T15	10 TV	3/4	27(,800)
	Pay-TV	12.518H/T16	10 TV	3/4	27(,800)
	Pay-TV	12.558H/T17	10 TV	3/4	27(,800)
	Pay TV	12.598H/T18	TV	3/4	27(,800)
	Pay-TV	12.638H/T19	10TV, 30 radio	3/4	27(,800)
	Pay TV	12.688H/T20	11TV	3/4	27(,800)
B1/160	7 Central DTV	12.365H	1TV	3/4	5(,100)
	Occ. feeds	12.380H	1 TV - *	3/4	6(,111)
	Occ. feeds	12.384V	1 TV - *	3/4	6(,111)
	Net 7 service	12.397H	1	3/4	7(,200)
	Imparja mx	12.379H	2TV + 8 radio	3/4	5(,424)
	7 digital feeds	12.397H	1TV	3/4	7(,200)
	Feeds to NZ	12.411V	1 TV	3/4	6(,111)
	SBS Mux	12.420H	3+ TV, 2+ radio	5/6	12(,600)
	TVNZ DTH	12.456V	5+TV	3/4	22(,500)
	TVNZ Tests	12.483V	up to 11TV	3/4	22(,500)
	Sky NZ	12.519/546V	7TV/7TV	3/4	22(,500)
	Sky NZ	12.581/608V	6TV/6TV	3/4	22(,500)
	Sky NZ	12.644/671V	9TV	3/4	22(,500)
	ABC HDTV	12.610H	5TV	7/8	14(,3288)
	Sky NZ	12.707/734V	8+TV	3/4	22(,500)
PR/166E	ABS-CBN	12.575H	4+TV, 4+ radio	2/3	13(,845)
	JEDI/TVB	12.686H	11+ TV	3/4	28(,126)
	ABC A-P	4180/970H	2TV, 2 radio	3/4	27(,500)
	Disney Pac	4140/1010H	typ 6 TV	5/6	28(,125)
	Taiwanese MUX	4080/1070H	12+ TV	5/6	30(,000)
	NHK Joho	4060/1090H	7TV, 1 radio	3/4	26(,470)
	FOX Mux	4040/1110V	up to 5TV	7/8	26(,470)
	NET +	4121/1029V	1 TV	3/4	4(,774)
	ESPN USA	4020/1130H	8+TV, data	3/4	26(,470)
	Discovery	3980/1170H	8 typ.	3/4	27(,690)
	CalBqt/Pas8	3940/1210H	up to 3+ FTA	7/8	27(,690)
	CNBC HK	3900/1250H	up to 7TV	3/4	27(,500)
	Filipino MUX	3880/1270V	up to 8TV+radio	5/6	28(,694)
	TaiwanBqt	3860/1290H	12TV + 30 r	5/6	28(,000)
	CCTV Mux	3829/1321H	up to 4 + 1 radio	3/4	13(,240)
	TVBS-N	3836/1314V	1FTA, 4+ CA	3/4	22(,000)
	EMTV PNG	3808/1342V	1 + 2 radio	3/4	5(,632)
	CNNI	3780/1370H	3, up to 5 TV	3/4	25(,000)
	Discovery Asia	3764/1386V	Up to 6 TV	3/4	19(,850)
	MTV	3740/1410H	8	2/3	27(,500)
P2/169E	WA Mux Pv	12.281V	3+ TV, radio	2/3	27(,500)
	Arlang TV	12.401V	1TV	3/4	4(,400)
	ABS-CBN	12.575H	4TV, 2 radio	2/3	13(,845)
	Test mux	12.715H	6+ TV	2/3	30(,000)
	TARBS feeds	4090V/1060V	9TV + radio	3/4	21(,000)
	BBC SCPC	3986/1164H	1TV	1/2	5(,700)
	Middle East	3836/1314V	4 typ	3/4	13(,331)

Receivers and Errata

FTA ; Singapore 23hrs, Brunei 1 hr, Brunei V1200 was on 4048V; New Caledonia, parts of Australia FTA SCPC; Australia, New Caledonia, some Eng. Irdeto 2; 4060V HDTV CA; also try 4020V PowerVu; some FTA (Ch. 1 & 3) CA & FTA NTSC: Japan, Taiwan (ApStar 6: also 4180V same #s; analogue also) also try 3660/3540V Vt, Sr 30.000, 3/4; some FTA VPID 512, APID 4112 Strong NZ & Australia; may now be 1/2, 6.525 Aust East beam - 3 FTA + 14 CA WA only? Skew path, intended Asia differs from 12.407 C1; **tune ch FTA; NZ+Au** T11/lower testing late May 2005 NZ + Au, FTA Mrcrypt CA occ feeds, NZ + Au; recently 12.553V New Feb 05; TVN racing, TV Korea, Telepace High performance beam; not NZ High performance beam; not NZ NZ + Au (Mrcrypt, PowVu capable) High performance beam; not NZ High performance beam; not NZ ABC WA tests, FTA SBS, radio tests WA FTA Irdeto V2 CA, tests (GWN, WIN) Widescreen ABC service feeds x 6 + tests; 29 radio CA, replaced Aurora T10 1 February 2005; 19 radio Tests; SBS-NDS CA, others FTA when here NZ (90cm) + Australia (**Only svc left on NZ; C1**) Australia NA only (leakage to Norfolk, New Cal) Australia NA only (leakage); 9-Net x 3 widescreen Arrow radio (still here), tone FTA Pay-per-view movies; CA Pay-per-view movies; CA Pay-per-view movies; CA currently repeating 12.438Hz; TVSN FTA Austar inter; **Expo FTA** NDS CA + Mrcrypt; CA CA, subscriptions available Australia, Norfolk Sky News active; 'Help x 2' FTA CA, subscriptions avail Au, Nrlrk, **TVSN FTA** CA, subscriptions available Australia, Norfolk 'Home' CA, subscription available Australia, Nrlrk CA, subscriptions available Australia, Norfolk CA, subscription available Australia, Norfolk CA, subscription available Australia, Norfolk Central beam; Freq change 08-05 * - plus 12.451H, 12.460H * - plus 12.293V, 12.402V, 12.411V Full schedule less commercials - links, may be CA PIDs vary; also try 12.360, 12.370 occ. digital feeds; typ fta Often NTSC; USA-Australia-NZ **Also 12.437H, 12.456H** same params; HDTV+WS FTA 7 channels (TVNZ x 4); +Maori_DW, CCTV9 Testing late June; 16:9 added late July NDS CA, subscription available NZ NDS CA, subscription available NZ NDS CA, subscription available NZ also see 12.626, 643, 670, 688, & 706H NDS CA, subscriptions available NZ CA June 2002-Irdeto-2 CA Dateline west; also east PAS2, 3901V PowVu CA Tests - CA service announced PowVu CA & FTA; subscription available was PAS-2, previously 3992Vt; **feeds FTA** NET25 + FTA; new PIDS April '03; reload PowVu CA; ch 11 DCP-CCP bootload; audio **FTA** PowVu/CA (some audio **FTA**) PowVu CA & **FTA** (EWIN + CBS + TBN +) NDS CA (6 channels); one test card occ FTA **Myx FTA** V1960, A1920 + radio FTA Mixed **FTA** & CA; STC gone (CA) PowVu FTA, replaces PAS-2 svc Difficult because of CCTV cross pole PowVu CA PowerVu; some audio **FTA** PowerVu; Asian MUX; new parameters Nov '03 # 8 **MTV China FTA V289, A290**; rest CA PowVu CA, WIN, ABC NT, SBS; status unknown Test - may not stay permanently 13(,845) Temp **FTA**; subs Aust 011-800-2270-0722 initially with 6 NTSC colour bars Occ **FTA** (Chile +); BIG power reduction Nov 03 BBC World moved here January 2005 **Irdeto 2 CA - subscriptions avail; Strong Tech**

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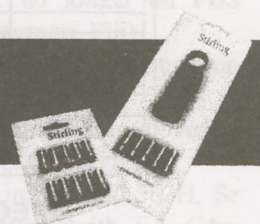


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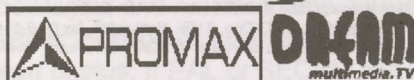
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Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym
(PAS2/169E)	Adventists.tv	4040/1010H	1	2/3	5(,900)
	Feeds	3868/1182H	1	2/3	6(,620)
	Feeds	3939/1211H	2 (typ NTSC)	2/3	6(,620)/7(,498)
	Cal PowVu	3901/1249H	up to 8	3/4	30(,800)
	HK bouquet	3850/1300H	up to 8	2/3	24(,900)
	Korean Bgt	3771/1379H	1	3/4	6(,510)
I804/174E	IPSTAR	12.619H	1	2/3	25(,220)
	Tests-NZ beam	12.646H	1	3/4	22(,418)
	RFO Poly	4027/1123R	1TV	3/4	4(,566)
I701/180E	TNTV	11.060&11.514V	9	3/4	30(,000)
	TVRFO	11.136V, 11.174V	6+TV, 3+ radio	3/4	23(,149)
	Canal+Sat	11.610H	16TV, 1 radio	3/4	30(,000)
	PBS	12.648HH	16TV possible	3/4	28(,066)
	TVNZ/BBC	4186/964RHC	1	3/4	5(,632)
	TVNZ	4178/972RHC	1	3/4	5(,632)
	AFRTS DTS	4175/975L	3 TV, 3 radio	2/3	3(,680)
	TVNZ/Aptn	4170/980RHC	1	3/4	5(,632)
	Fiji Sky Pacific	4095/1055LHC	6TV + future radio	3/4	16(,505)
	Fiji Sky Pacific	4055/1095LHC	6TV + future radio	3/4	16(,505)
	TVNZ/feeds	4052/1098RHC	1	3/4	5(,632)
	TVNZ feeds	4044/1106R	1	3/4	5(,632)
	NZ Prime TV	4024/1126L	1	2/3	6(,876)
	NBC to 7 Oz	3960/1190R	1	7/8	6(,447)
	TBN Mux	3927/11223R	3TV	2/3	9(,100)
	WorldNet	3886/1264R	1TV, 37 radio	3/4	25(,000)
	Ioarana	3772/1378L	1	3/4	4(,566)
	NASA TV	3854/1296R	1 TV	3/4	2(,000)
	TVNZ	3846/1304R	1	3/4	5(,632)
	NBA (Barker) Ch	3803/1347R	1	3/4	6(,111)
	USA feeds	3749/1401R	4?	?	26(,400)
NSS-5/177W	Pacific IP Data	3763/1387R	none-data	3/4	27.5
	BYU-TV	4185/965R	1TV, 20+ audio	1/2	6(,525)
	IPSTAR Tests	12.691V	8 TV	5/6	17(,600)
	Russian TV tests	12.744V	2 TV	3/4	3(,977)

Receivers and Errata
New December 2003; 24/7 "Hope Chs."
FTA (occ sport); also try 3863, Sr6.100
FTA-typ NTSC-occ sport, live Shuttle
PowVu CA + FTA (includes BBC-W 05-05)
was 4148Vt; some FTA
Korean MUX, reload 12-04; new Sr
Tests, late May start; also 12.646H
Testing possible data links; June 2003
SE spot beam; was 4027LHC
east spot; 10TV + r each, vertical pol.
FTA 11.136 Tahitian beam, 11.174 west beam; 12/04
1+ FTA, MediaGd "2"; + 10.975 weaker
Testing Fiji region pay-TV (MDS) package (Oct '04)
DMV/NTL early vers. occ feeds, typ ca
DMV/NTL early vers., occ feeds, typ ca
DTS Direct to Sailors; audio previously FTA - gone
DMV/NTL early vers. occ feeds, typically ca
Nagravision CA (> Feb 1, 2005) New PIDS
All now (including Fiji 1) CA; 7 Feb, 2005)
DMV/NTL early vers. occ feeds, typ ca
SCPC, mixed CA and FTA feeds
PowVu CA; Auckland net feeds
CA, Leitch encoded
Church Ch (1560), TBN (1760), JCTV(1860) W hemi
New PIDS Dec 03 very strong NZ, Pacific
FTA SCPC; East Hemi Beam-Tahiti
24/7 live NASA - West Hemi bm (can be difficult)
SCPC, mixed CA & FTA, feeds
NBA feeds - probably CA - new Nov 2003
16-QAM (not MPEG-2 compatible)
Data only but useful for dish alignment
Global beam - requires sizeable dish
CA Tests - Taiwan TV; data coming?? (NZ beam)
Tests - may not last (May 2005); NZ bm; PKVS, REN

MPEG-2 DVB Receivers: (Data here believed accurate; we assume no responsibility for correctness!)

AV-COMM R3100. FTA, excellent sensitivity (review SF May 1998); new version Sept '99. AV-COMM P/L, 61-2-9939-4377.

AV-COMM Tiny Tot. FTA, 12Vdc operated, palm sized, low power consumption; review SF#120. Contact # above.

AV-COMM R3100(A). FTA, good sensitivity, ease of use exc (review SF May 2002). See above contact.

Coship 3188C. Review SF#107. Blind search FTA rcvr; works well. Phoenix Technology Group (www.phoenixsatellite.com.au) (Irdeto 2 as well as FTA versions)

Divitone: "Left-handed" review SF#115; does "code key" entry. Available <http://www.satmax.ws>

eMTEch eM-100B (FTA), eM-200B (FTA + Cx2), eM210B (FTA + 2xCI + positioner); KanSat 61-7-5484 6246 (review SF#89)

Fortec Star Lifetime. Two versions, both blind search, code-key programmable, one X 2 CI. Review SF#119. www.aDigitalLife.com

Humax ICRI 5400 (Z). Embedded Irdeto + 2 CAM slots; initial units had NTSC glitch, now fixed. Widely available; new software avail 04-04. SF#76.

Humax IRCI 5410 (Z). Adaptable version capable of holding multi-CA systems (SF#98, 99). Widely available; original importer Sciteq (www.sciteq.com.au).

Hyundai-TV/COM. HSS100B/G (Pacific), HSS-100C (China) FTA. Different software versions; 2.26/2.27 good performers, 3.11 and those with Nokia tuners also good; later 5.0 not good.

Hyundai HSS700. FTA, PowerVu, SCPC/MCPC. Review SF March 1999. Kristal Electronics, 61-7-4788-8902.

Hyundai HSS800CI. FTA, Irdeto (with CAM) + other CA systems, PowerVu, NTSC. Kristal Electronics, above; review SF#63.

INNOVIA IDS3088. Review SF#111. Blind search FTA receiver. High quality IRD; available Phoenix Technology Group, and Satmax (<http://www.satmax.ws>).

ID Digital CI-24 Sensor. New August 2003; new lower noise tuner, extra sensitivity; CI Interface slot Irdeto 1 & 2; review SF#109. Sciteq 61-8-9409-6677.

MediaStar D7.5. New (May 00) single chip FTA; review June 00 SF. MediaStar Comm. Int. 61-2-9618-5777

MediaStar D10. FTA and Irdeto embedded CA. VG receiver; see review SF#96, August 2002. Contacts immediately above.

MultiChoice (UEC) 660. Essentially same as Australian 660, not grey market contrary to reports. Sciteq tel 61-8-9306-3738

Nokia "d-box" (V1.7X). European, FTA, may only be German language, capable of Dr. Overflow software. SF#95, p. 14.

Nokia 9200/9500. When equipped with proper software, does Aurora, originally did pay-TV services provided software has been "patched" with "Sandra" or similar program. See SF#95, p. 14, SF#96 p. 15. SatWorld 61-3-9773-9270 (www.satworld.com.au)

Pace DGT400/DVR500. Originally Galaxy (Now Foxtel+Austar). Irdeto, some FTA with difficulty (Foxtel Australia 1300-360818). UECs replaced; Sept 18 (2003) "drop-dead" day; all were to have been "turned off" on that date (in fact, those with V1.13 CAMs may still be working; still does radio including CA, not TV).

Pace "Worldbox" (DSR-620 in NZ). Non-DVB compliant NDS CA including Sky NZ, no FTA; similar "Zenith" version (see SF#115, p. 15).

Phoenix 111, 222, 333 models (no longer produced): Service, backup - Phoenix Technology Group 61 3 9553 3399; www.phoenixsatellite.com.au

Pioneer TS4. Mediaguard CA (no FTA), embedded Msym, FEC, only for Canal+Satellite (AntenneCal ++687-43.81.56)

PowerVu (D9223, 9225, 9234). Non-DVB compliant MPEG-2 unless loaded with software through ESPN Boot Loader (see below). Primarily sold for proprietary CA (NHK, CMT etc). For service only - call Scientific Atlanta 61-2-9452-3388. For revision model D9850, see Scientific Atlanta (below).

PowTek. Blind Search Chinese sourced, field tests rate it highly. Source jason@aDigitalLife.com

Prosat 2102S. FTA SCPC/MCPC, NTSC/PAL, SCART + RCA. Sciteq 61-8-9306-3738.

SatCruiser DSR-101. FTA SCPC/MCPC, PowVu, NTSC/PAL. (Skyvision Australia 61-3-9888-7491, Telsat 64-6-356-2749); no longer available.)

SatCruiser DSR-201P. FTA SCPC/MCPC, PowVu, NTSC/PAL, analogue, positioner - (Skyvision - see above); no longer available.

SATWORK ST3618. Blind search FTA receiver. Fast search, problems, especially in "memory-filing" system; review SF#111. Available DMSi at tim@dmsiusa.com.

SATWORK ST3688. Blind search, 3000+ ch memory, multi-format RF modulator, improved version 3618. Review SF#113; available DMSi (above).

Scientific Atlanta D9223, D9234, D9225; Orig. PowerVu, superseded Dec 2003 by D9850. Commercial receiver, available TVO 61-2-9281-4481, John Martin

Strong Technologies SRT2620. SCPC, MCPC FTA, exc sensitivity, ease use, programming. Review SF#91 (ph. below).

Strong SRT 4600. SCPC, MCPC, PowerVu; exc graphics, ease of use, review SF#64. Strong Technologies 61-3-8795-7990.

Strong 4800. SCPC, MCPC, embedded Irdeto+ CAM slots, does code-key with additional software, Aurora. Strong Technologies 61-3-8795-7990.

Strong 4800 II. SCPC, MCPC CAM slots x 2 for Aurora +, Zee, Canal +, code key with additional software. Strong Technologies (above); review SF#103.

Strong 4890. SCPC, MCPC, 30Gb PVR, 2 CAM slots, DiSEqC 1.0, 1.2 (review SF#84), does code key with additional software; Strong Technologies, # above.

UEC Atlas/Titan (1000). New July 2003, replacing DGT400 for Austar. No SCART, L-band loop; also available Rural Electronics 61-2-6361 3636.

UEC642. Designed for Aurora (Irdeto), approved by Optus; w/new software, C-band FTA; faulty P/S. Norsat 61-8-9451-8300.

UEC660. Upgraded UEC642, used by Sky Racing Aust., Foxtel, limited FTA. (Nationwide - 61-7-3252-2947); P/S problems.

UEC700/720. Single chip Irdeto built-in design for Foxtel; unfriendly for FTA. Power supply problems, seldom sold to consumers; propensity to fall off back of trucks.

Voyager. Two models (08-05); one FTA auto scan, 6000 ch memory; one multi-CA format CAM. Satlinknz.co.nz

Winersat DigiBox 200. C + Ku basic receiver but includes Teletext for NZ TVOne, 2 VBI. Satlink NZ fax 64-9-814-9447; long term teletext problems (loses TT).

"X" Digital. When modified with "aftermarket" Internet swfwe, does Aurora and other V-1 CA without card; review SF#119. Strong Technologies (61-3-8795-7990).

Accessories:

Aurora smart cards. MCRYPT (Irdeto V2) cards now available (Jan 2005), Sciteq 61-8-9409-6677.

PowerVu Software Upgrade: PAS-8, 4020/1130Hz, Sr 26.470, 3/4; pgm ch 11 and follow instructions (do not leave early!)

PowerVu (Pacific) repair service: Cable & Sat Svcs, Darius West, 61-2-9792-1421 (Email darius@cases.net.au)

WITH THE OBSERVERS

AT PRESS DEADLINE

STI-5518 satellite processor receivers are not past-tense. Watch (October SatFACTS) for details on brand new high capacity processor receivers (and terrestrial digital versions) using new "super-chip". Faster, composite video out, more functions. Today's satellite receivers using 5518s just went into the dust bin.

Launches: Next scheduled launch October 27 for (Indonesian) Telekom 2, heading to 118E, with 24 C-band transponders. Only other regional launch for balance of this calendar year: InSat 4A to 83E, 12 each C and Ku - Ariane 5 launch date uncertain.

AM3/ 140E: "Now operational, but no reports yet from southern hemisphere." (DL, NSW) (Editor's note: Check 3675RHC, Sr 33.468 for at least 3 channels.)

ApStar 6/134E: "4140V and 4180V have been active with new FTA services (Sr 27.500, FEC 7/8 both). Global Travel Channel is on 4140 (VPID 3200, APID3201); Top Music on 4180 (VPID3010, APID3011)". (Tony)

AsiaSat 2/ 100.5E: "It appears 'the gang' may be breaking up; European Bouquet (As2 4000 Hz) looks to become two or more separate MCPCs using As3S rather than this satellite, effective 1 December, or sooner. DW has announced they will migrate to 3760H, Sr 26.000, 7/8 on AsiaSat 3S on 1 December and run parallel on their existing (AS2) 4000H until approximately mid-January. Of interest, the DW announcement does not mention what happens to RTPI, TV5, RAI, WRN and others currently within the 'European Bouquet' on As2. TV5 pre-empted the DW announcement with their own; they are moving to As3S early in October, from As2 (to 3760H, Sr 26.000, 7/8 - yes, same parameters as DW which suggests we are not being told the full story here!). (Hans Versluys, TTV, Auckland) (Editor's note: The Euro Bouquet management structure has always been a problem for all participants except DW. Because Germany conceived the original plan, and took management control from day one, the others who joined have long [but quietly] complained that 'the Germans are only interested in their own service and not responsive to the needs of the others'. MCM, one of the original video participants, bailed out over a squabble with German management, and this left one video programme channel essentially unused. Germany has slowly expanded the number of audio channels [currently 21] to take up the bandwidth slack of one missing video service. The future of As2 'Euro Bouquet' is unknown, so where this leaves the many popular radio services [such as Swiss Radio, WRN, Radio Canada etc.] and the video channels from Portugal and Italy is unanswered for the moment. As a practical matter, by being 4.5 degrees further east, a tiny area in the mid-Pacific east of Fiji will have first time service from the new satellite

location. German contact is Manfred Kritsch, Manfred. Kritsch @dw-world.de and www.dw-world.de)

AsiaSat 3S/ 105E: "Popular Chinese movie service (action flicks) MATV (4111H, Sr13.650, 3/4) is now CA (Irdeto 1)". (Charlie, HK) "TV One Pakistan on 3739V, Sr 2.893, VPID 33, APID 36, FTA." (Frankie S.)

AsiaSat 4/122E: "Central China TV in high definition tests on 4060V, Sr 27.500, 3/4 VPID 512, APID 650 but Irdeto2 CA!" (Kenneth) "Henan DTV + 2nd Channel Uni TV 4100V, FTA, Sr 27.500, 3/4". (W. Rock)

Intelsat 701/180E: "TBN Pacific no longer on PBS 12.648H; info card or blank carrier." (Herman, Fiji)

IpStar/118E: "Reports suggest it may do initial turn-on sequence testing from 100E." (C.Sutton, NZ)

Optus B1/160E: "Seven Central + Taima Radio moved to 12.365H from 12.354H, FTA, Sr 5.100, 3/4" (David)

Optus B3/ 152E: "Many changes in T13, 12.563H, Sr 30.000, 2/3. It now carries Mcrypt along with SA CAs. Briefly, it carried IRIB3 which is from Iran (unlike the other so-called Iranian channels, which actually originate in the USA). As of early September, it currently loads (11 TV, 2 radio) as: (1) TVN Racing (still FTA), (2) TVK (new PIDs) FTA (Korean with KBS World, some English subtitling + Australian adverts), (3) TV Polonia (CA Mcrypt, Polish, with new PIDs), (4) MBC (FTA) Korean, contains some subtitling, some Australian news and adverts), (5) Setanta Sport (not running full-time, or loses PIDs, has been used for FTA and CA feed of sports, but never seen 'Setanta Sport' itself FTA), (6) Telepace (Italian, Roman Catholic) - when running is FTA but it seems to be missing first few days of each month, suggesting a funding problem ("the cheque is in the mail!"), (7) Channel One (Iranian from California), typically CA, (8) ITVN (FTA, Polish), (9) Dhamma Channel (FTA, Thai, Buddhist, Religious - also on 'Ad Hoc' transponder T5), (10) AMTV (FTA, the return of the Australian 'multi-cultural channel' which was for a few days during August FTA on B3 T5), (11) Healing Channel (USA based Christian religious channel, for Iranians; primarily US Baptist programming including Benny Hinn). On this transponder radio: (1) Radio Polska (CA, Mcrypt, Polish), and (2) IFN (Internal feedback for Globecast's field broadcast units)." (IF, Qld.) "Previously, Tr1 (centre frequency 12.282V) contained many narrow bandwidth SCPCs and a non-MPEG2 SCPC of about 6 Msym. Now only the 6 Msym service remains. Meanwhile,

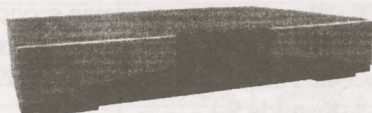
WITH THE OBSERVERS: Reports of new programmers, changes in established programming sources are encouraged from readers throughout the Pacific and Asian regions. Information shared here is an important tool in our ever expanding satellite TV universe. **Photos of yourself, your equipment** or off-air photos taken from your TV screen are welcomed. TV screen photos: If PAL or SECAM, set camera to f3.5-f5 at 1/15th second with ASA 100 film; for NTSC, change shutter speed to 1/30th. Use no flash, set camera on tripod or hold steady.

Alternately submit any VHS speed, format reception directly to SatFACTS and we will photograph for you. Deadline for Octoberber 15th issue: October 4th by mail or 5PM NZT October 5th if by fax to 64-9-406-1083 or Email skyking@clear.net.nz.

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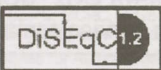
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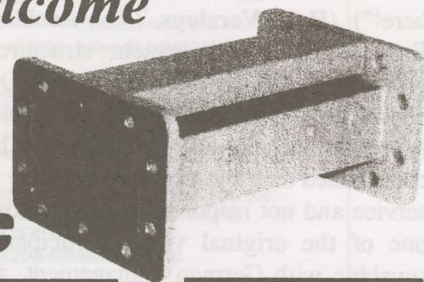
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These firms are available to do contract dish installs

Fiji Islands

C.B. Communications, **Sigatoka** (Ph6520227; cbcom@connect.com.fj)
Safeway Electronics Ltd, **Suva + Lautoka + all islands** (Ph 3395300/6666822; safeway@connect.com.fj)
SATSHEK Communications, **Suva** (Ph3307933; parmarbros@connect.com.fj)

French Polynesia

Telexpert-Tahiti, **all of French Polynesia** (Ph 689 77 11 25; Fax 689 83 89 00; telexpert@mail.pf)

New Zealand:

Tauranga TV Svcs Ltd, western **Bay of Plenty** (ethnic Ku packages) (Ph 07 578 7276; dave-tts@clear.net.nz)
Raycom, **Coromandel Peninsula/Waihi/Tairua** (B1 FTA) (Ph 07 864 8083; raycom@slingshot.co.nz)
Frontline Electronics, **Mosgiel** region (ethnic Ku packages) (Ph 03 489 4001)
Advanced Aerials, **Napier/Hawkes Bay**, comcls (Ph06835 6618/021 272 6618; advancedaerials@xtra.co.nz)
Nelson TV & Video Svcs, all **Nelson Bays** (Ph 03 548 0304; ntv@tasman.net)
Rexels AV Electronics Ltd, **Palmerston N, Manawatu, Hawke's Bay, Wanganui** (Ph 06 357 6186; rsi.blair@xtra.co.nz)

John Stewart, **southland** including Otago (john.s@tritec.co.nz)

The Antenna Man, **Taranaki** (Ph 06 758 1633; antenna.man@xtra.co.nz)

Quality Pics, entire **Waikaito** region (Ph 0800 007 667; maxnkay@xtra.co.nz)

Smartzone, **Wellington-Wairarapa-Palmerston N** (C+Ku) (Ph 029 289 6333; info@smartzonesystems.co.nz)

Homestead HiTech, **Wellington, Masterton-Levin** (PAS-2, B1, B3) fitzgera@ihug.co.nz)

Australia Wide

Regional Outcomes (60+ locations, **all states, territories**) (03 9923 7333; installs@regionaloutcomes.co.au)

New South Wales:

Woolgoola Antenna Service, **Coffs Harbour** (50km radius) (Ph 0266561889; woopaerials@iprimus.com.au)
Town & Country Antennas, 60km radius **Murwillumbra/Tweeds Heads** (Ph 02 6672 8595)
Newcastle Satellite, **Newcastle + Lwr Hunter Vly** (Ph 0249614449; satellites@netcentral.com.au)
Home Satellite TV, 40km radius **Port Macquarie** (Ph 02 6584 3838; kazbah25@optusnet.com.au)
Goodcom Communications P/L, 100km radius of **Walcha** (Ph 02 6777 1044; goodcom@northnet.com.au)

Northern Territory

ALLSAT TV, **Darwin and NT**; (Ph 08-8927 1300, 04 3771 0797; allsat.tv@pacific.net.au)

Queensland:

Teleworks, 100km of **Cairns** (C + Ku). (Ph 0412 84115; rajvrm@aol.com)
Cape York Electronics, **Cooktown and 'the cape'** (started 1970s) (Ph 07 40 695 252; cyectn@tpg.com.au)
Phil's Antenna Systems, 100km radius of **Hervey Bay** (C+Ku since 1996). (Ph 0741 256 273)
Rick Dalton TV & Satellite, 100km of **Kawana Waters** (C + Ku). (Ph 07 5493 4343; rick@antechtv.com.au)
Videotronics Mackay, **Mackay/Whitsundays** radius 200km. (Ph 07 495 575 052; sales@videotronics.com.au)
Tableland Ant Svcs, **Malanda, Atherton T'lands + 'Gulf/ Cape'** (Ph 07 40966262; tabantennaserv@bigpond.com (*)

South Australia

Central Eyre Comms, **Arno Bay-Eyre Penins.** (Ph 08 8628 0203; centraleyrecomms@ozemail.com.au)

Tasmania:

.65 Electronics, **Launceston and Northern Tasmania** (Ph 03 63 330820; sales@65group.com)

Victoria:

Riviera Satellite Antenna Svcs, 100km radius **Bairnsdale** (Ph 03 5152 4884; gilhooleystv@net-tech.com.au)
Leden Communications, (100km radius) **Glengarry** (Ph 0427 745105; leden@netspace.net.au)
Geoff's Communications, 60km radius **Korumburra** (Ph 0408 582010; gwyhoon@tpg.com.au)
Foreign Satellite TVP/L, **Melbourne (region)** C+Ku since 1995 (Ph 040445509; joe12@dodo.com.au)
H and J Instruments, (100km radius) **Wodonga**, C and Ku since 1970 (Ph 02 6027 1574)

Solomon Islands

Satellite Solutions, **Honiara + all Solomon Islands** (since 1994) (Ph 677 25589; satsol@solomon.com.sb)

Thailand:

JSAT tv/Jon Clarke, **ex-pat community - nationwide** (Ph +661 513 5418; info@jsat.tv)

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Tr 9 (centre frequency 12.313H) was also packed with occasionally used by Globecast TVN feeds (12.336H, Sr narrowband SCPCs. Presenrly, only a small number remain 6.666, 3/4)". (AI, NSW)
in lower half of the transponder. The upper half is **Optus C1/ 156E**: "Aurora MUX previously 12.324V (TIU) may be found at 12.728V, Sr 24.450, 1/2". (GWB)

Thaicom 2-3/78.5E: "Digital World (Pakistan) 3639, Sr 28.066, 3/4, VPID 3842, APID 3843; inside much larger bouquet". (B. Richards, SA)

Soapbox: "The Bo-Dickey, p. 22 SF#132, looks like a fantastic product; I hope it sells well." (IF, Qld.) (Editor's note: Anyone who has been faced with preparing RG6 cable for a connector will quickly appreciate how useful it is!) "Muller branded STB for Australian terrestrial TV is a brand name of Cole Myers Ltd., made in China, operates from a wallwart plugpack so it will probably operate from a 12VDC source." (AI, NSW) "At fringe locations, in rural NSW, the coverage for analogue and digital from the same translator site can be quite different. Some receiving locations with poor analogue have reliable digital but of greater concern,

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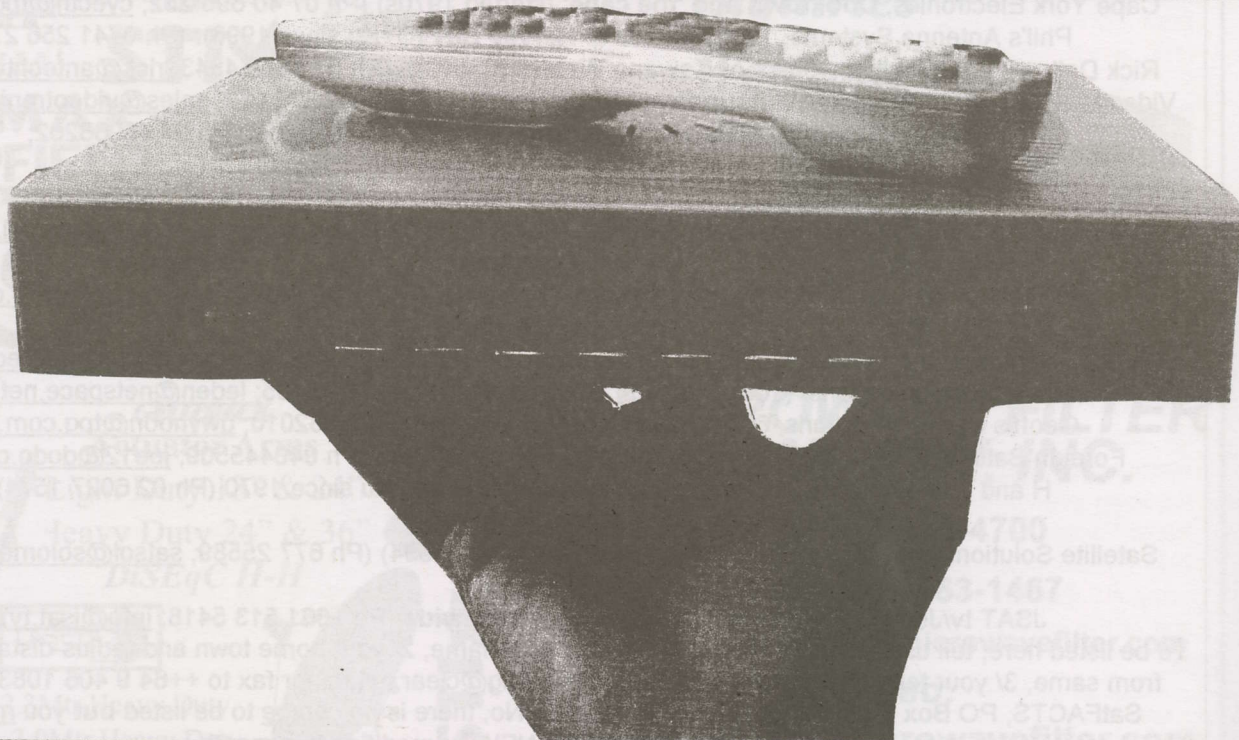
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consumer TVs at locations where analogue is P4 or even P5 find their digital is below threshold and will not lock." (NS, Victoria) (Editor's note: The more experience we gain with digital installations, the more confusing it all becomes. The best rule may be, forget all about analogue at a given site and concentrate on the digital only. Sooner than later the analogue will cease, leaving digital as the only service. If you cannot make that work, well, have the consumer complain to the ABA.) "UBI is currently a (terrible) mess. All of the changes that have occurred in the last two weeks of August would fill several pages in SatFACTS. I feel very sorry for their subscribers. UBI has been advertising a complete change of channel allocations (some gone, some new, the remainder on different channels) to have taken place 1 September. Alas, their software guys and gals have made a mess of it. As an aside, I doubt any of the Turkish channels are currently on the air (September 3), while two of the MCPCs are copies of one another. And the list goes on and on, too complex to even care about at this point!" (HE, Qld.) "Growth: DISH TV USA and DirecTV USA both added 225,000 new subscribers during 90 day period ending June 30; British BSkyB, beset with serious competition from terrestrial FTA 30 channel digital service, only managed 83,000." (Jeremy, UK) "As reported in SF#132, iHUG PAS-2 stopped on 31 August, prior to which iHUG dishes were to have been repointed to C1, have a new LNBF fitted, install a new security program ('Telleque'), and modify the iHUG PID settings to the replacement firm (Bordnet) PIDs. The new replacement for iHUG is 12.407V (C1), with details on http://www.bordnet.co.nz/support_settings.htm." (Robert, Auckland)

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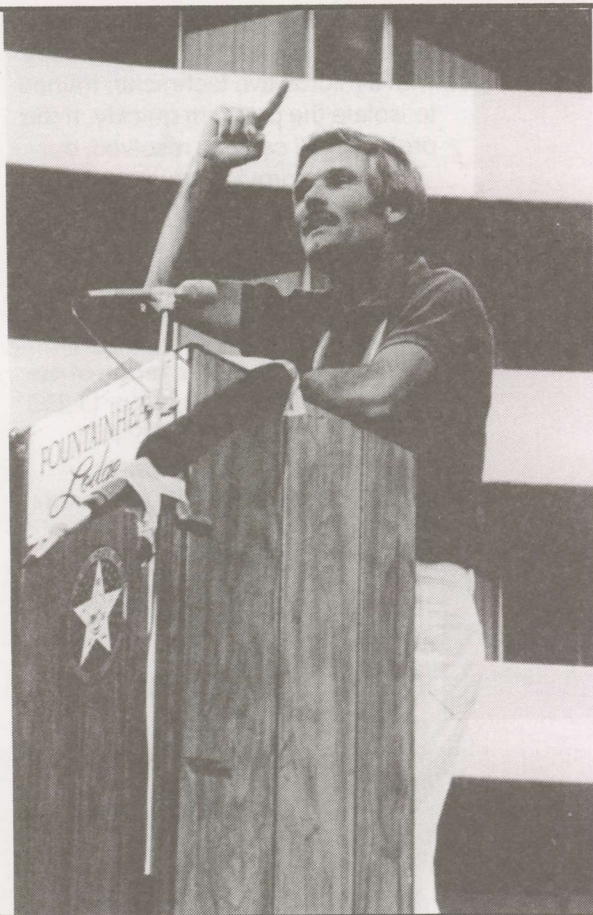
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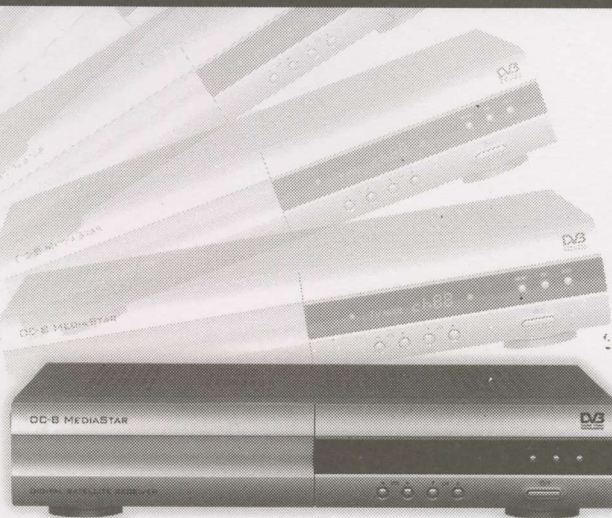
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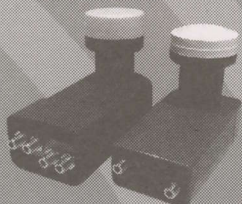


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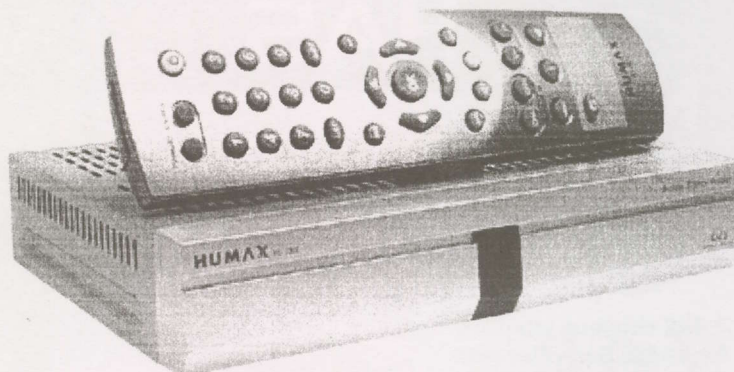
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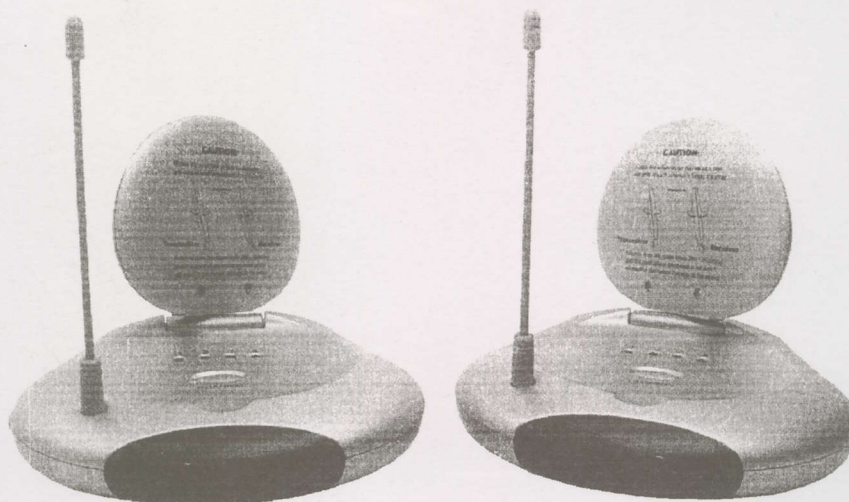


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